etc.

a review of general semantics

BENJAMIN LEE WHORF: Language and Behavior

S. I. HAYAKAWA: Poetry and Science

JANICE V. KENT: Semantic Reactions in Art Education

LESLIE A. WHITE: The Symbol

STILLMAN DRAKE: A. B. Johnson and His Works on Language

Discussion: CECIL W. MANN, Vocabulary Tests; F. K. RICHTER, Hitler and Words; WILBUR E. MOORE, New Patterns for Debate; EDWARD J. RUTAN and ENGELBERT J. NEUMAYER, Something New in Teaching Grammar

BOOK REVIEWS: Wendell Johnson, M. Alden Countryman, David Donald Malcolm

NEWS AND MISCELLANY

READERS' CORRESPONDENCE

Vol. I, No. 4 Summer 1944

ETC.:

A REVIEW OF GENERAL SEMANTICS

VOLUME I | SUMMER, 1944 | NUMBER 4

CONTENTS

THE RELATION OF HABITUAL THOUGHT AND BEHAVIOR TO LANGUAGE ..... Benjamin Lee Whorf 197

POETRY AND SCIENCE ..... S. I. Hayakawa 216

IMPROVING SEMANTIC REACTIONS THROUGH ART EDUCATION ..... Janice Vance Kent 225

THE SYMBOL: THE ORIGIN AND BASIS OF HUMAN BEHAVIOR ..... Leslie A. White 229

A. B. JOHNSON AND HIS WORKS ON LANGUAGE ..... Stillman Drake 238

DISCUSSION:

VOCABULARY TESTS AND INTELLIGENCE: A REPLY TO DR. GLICKSBERG ..... Cecil W. Mann 253

ADOLF HITLER AND WORDS ..... F. K. Richter 256

NEW PATTERNS FOR DEBATE ..... Wilbur E. Moore 258

SOMETHING NEW IN TEACHING GRAMMAR ..... Edward J. Rutan and Engelbert J. Neumayer 261

BOOK REVIEWS: Frank Heller, *The Twilight of the Gladiators,* and B. Croce, *Germany and Europe* (Wendell Johnson); G. Gamow, *Mr. Tompkins Explores the Universe* (M. Alden Countryman); F. Aydelotte, *Breaking the Academic Lock Step* (David Donald Malcolm) 264

NEWS AND MISCELLANY 270

CORRESPONDENCE 274

ETC: A REVIEW OF GENERAL SEMANTICS, official organ of the Society for General Semantics, is devoted to the encouragement of scientific research and theoretical inquiry into Non-Aristotelian systems and General Semantics. Issued four times a year, September, December, March and June. *Editor:* S. I. HAYAKAWA. *Assistant Editor:* F. K. RICHTER, Department of Language and Literature, Illinois Institute of Technology. *Consulting Editors:* A. KORZYNSKI, M. KENDIG, Institute of General Semantics. *Associates:* WENDELL JOHNSON, Associate Professor of Psychology, State University of Iowa; RAYMOND W. MCNEALY, M.D., Professor of Surgery, Northwestern University; IRVING J. LEE, Captain, United States Army; CHARLES B. CONGDON, M.D., Psychiatrist, Student Health Service, University of Chicago; SANFORD B. MEECH, Associate Professor of English, Illinois Institute of Technology. Subscription price (payable in advance): $3 a year. *Business and Editorial Offices:* Illinois Institute of Technology, 3300 Federal St., Chicago 16, Ill. *Publication Office:* 217 W. Jefferson St., Bloomington, Ill. Entry as second class matter applied for at the post office at Chicago, Ill., under the Act of March 3, 1879.

SOCIETY FOR GENERAL SEMANTICS: *President,* Charles B. Congdon, M.D. *Directors:* Raymond W. McNealy, M.D.; S. I. Hayakawa; Mrs. Carl M. Plochman, *Evanston, Illinois;* Edwin S. Hewitt, *Chicago;* Thomas D. Eliot, *Northwestern University;* Elsie Smithies, *University H. S., Chicago. Secretary-Treasurer:* KARL G. HAUCH. Correspondence both to the Society and to *ETC.* should be addressed to 3300 Federal St., Chicago 16, Ill.

THE RELATION OF HABITUAL THOUGHT AND BEHAVIOR TO LANGUAGE

BENJAMIN LEE WHORF

[EDITOR'S FOREWORD: *Few people have been as well qualified as Benjamin Lee Whorf to explain, from personal knowledge and study, what is meant by the expression, 'the structure of language.' An outstanding authority on the Mayan and Aztec civilizations and on American Indian languages, he was intimately acquainted with languages whose basic structures were totally unlike those of the Indo-European languages. What is even more to the point, Mr. Whorf was extraordinarily sensitive to the* non-linguistic consequences *of linguistic behavior. It is obvious from his writings that, all the time he was investigating languages, whether among the Pueblo villages of Central Mexico or among the Hopi in Arizona, he must have been watching what was going on—what actions, what attitudes, what events accompanied or resulted from the utterances he was so carefully recording.*

Among Mr. Whorf's many contributions to language study, the highest place must be accorded —at least in the eyes of those interested in general semantics—to his demonstration through comparative linguistics that our day-to-day orientations in life, to say nothing of our 'reasoning processes' and our 'philosophies,' rest upon the structure of the language which we happen to have inherited. Our 'common sense,' our most basic 'intuitions' into the 'nature of things,' our dichotomy of 'form' and 'substance,' our notions of 'time,' 'space,' and 'matter,' and even our life-habits and our social institutions are shaped to a degree hitherto unsuspected, Mr. Whorf believed, by the structuralizations which our languages impose upon the flux of experience.

'The Relation of Habitual Thought and Behavior to Language' combines Mr. Whorf's experiences as anthropologist, linguist, grammarian, and fire insurance executive. Born in 1897 in Winthrop, Mass., he was a graduate of M.I.T., and served as a private in the engineering corps during World War I. In 1919 he joined the Hartford Fire Insurance Company, and was assistant secretary of the company at the time of his death, July 26, 1941. He began his study of Aztec and Mayan cultures, as a hobby, in 1925. Within a few years he had become one of the nation's leading Americanists. Many of his articles, the results of field work in Mexico and the Southwest as well as of private study, were published in Technology Review. *Two of his articles, 'Languages and Logic,' published in* Papers from the Second American Congress of General Semantics, *and 'Science and Linguistics,' reprinted as an appendix to Hayakawa's* Language in Action, *are already familiar to students of general semantics. A more complete biography with bibliography will be found in the* National Cyclopedia of American Biography.

The present article is reprinted by permission from Language, Culture, and Personality: Essays in Memory of Edward Sapir (*Menasha, Wisconsin, 1941*).]

THERE will probably be general assent to the proposition that an accepted pattern of using words is often prior to certain lines of thinking and forms of behavior, but he who assents often sees in such a statement nothing more than a platitudinous recognition of the hypnotic power of philosophical and learned terminology on the one hand or of catchwords, slogans, and rallying-cries on the other. To see only thus far is to miss the point of one of the important interconnections which Sapir saw between language, culture, and psychology, and succinctly expressed in the introductory quotation.* It is not so much in these special uses of language as in its constant ways of arrang-

* See next page.

ing data and its most ordinary every-day analysis of phenomena that we need to recognize the influence it has on other activities, cultural and personal.

The Name of the Situation as Affecting Behavior

I came in touch with an aspect of this problem before I had studied under Dr. Sapir, and in a field usually considered remote from linguistics. It was in the course of my professional work for a fire insurance company, in which I undertook the task of analyzing many hundreds of reports of circumstances surrounding the start of fires, and in some cases, of explosions. My analysis was directed toward purely physical conditions, such as defective wiring, presence or lack of air spaces between metal flues and woodwork, etc., and the results were presented in these terms. Indeed it was undertaken with no thought that any other significances would or could be revealed. But in due course it became evident that not only a physical situation *qua* physics, but the meaning of that situation to people, was sometimes a factor, through the behavior of the people, in the start of the fire. And this factor of meaning was clearest when it was a *linguistic meaning*, residing in the name or the linguistic description commonly applied to the situation. Thus around a storage of what are called 'gasoline drums' behavior will tend to a certain type, that is, great care will be exercised; while around a storage of what are called 'empty gasoline drums' it will tend to be different—careless, with little repression of smoking or of tossing cigarette stubs about. Yet the 'empty' drums are perhaps the more dangerous, since they contain explosive vapor. Physically the situation is hazardous, but the linguistic analysis according to regular analogy must employ the word 'empty,' which inevitably suggests lack of hazard. The word 'empty' is used in two linguistic patterns: (1) as a virtual synonym for 'null and void, negative, inert,' (2) applied in analysis of physical situations without regard to, e.g., vapor, liquid vestiges, or stray rubbish, in the container. The situation is named in one pattern (2) and the name is then 'acted out' or 'lived up to' in another (1); this being a general formula for the linguistic conditioning of behavior into hazardous forms.

In a wood distillation plant the metal stills were insulated with a composition prepared from limestone and called at the plant 'spun limestone.' No attempt was made to protect this covering from excessive heat or the contact of flame. After a period of use the fire below one of the stills spread to the 'limestone,'

'Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the 'real world' is to a large extent unconsciously built up on the language habits of the group. . . . We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation.'—EDWARD SAPIR, 'The Status of Linguistics as a Science,' *Language*, Vol. V, pp. 209-210 (1929).

---

which to everyone's great surprise burned vigorously. Exposure to acetic acid fumes from the stills had converted part of the limestone (calcium carbonate) to calcium acetate. This when heated in a fire decomposes, forming inflammable acetone. Behavior that tolerated fire close to the covering was induced by use of the name 'limestone,' which because it ends in '-stone' implies noncombustibility.

A huge iron kettle of boiling varnish was observed to be overheated, nearing the temperature at which it would ignite. The operator moved it off the fire and ran it on its wheels to a distance, but did not cover it. In a minute or so the varnish ignited. Here the linguistic influence is more complex; it is due to the metaphorical objectifying (of which more later) of 'cause' as contact or the spatial juxtaposition of 'things'—to analyzing the situation as 'on' versus 'off' the fire. In reality the stage when the external fire was the main factor had passed; the overheating was now an internal process of convection in the varnish from the intensely heated kettle, and still continued when 'off' the fire.

An electric glow heater on the wall was little used, and for one workman had the meaning of a convenient coat-hanger. At night a watchman entered and snapped a switch, which action he verbalized as 'turning on the light.' No light appeared, and this result he verbalized as 'light is burned out.' He could not see the glow of the heater because of the old coat hung on it. Soon the heater ignited the coat, which set fire to the building.

A tannery discharged waste water containing animal matter into an outdoor settling basin partly roofed with wood and partly open. This situation is one that ordinarily would be verbalized as 'pool of water.' A workman had occasion to light a blow-torch nearby, and threw his match into the water. But the decomposing waste matter was evolving gas under the wood cover, so that the setup was the reverse of 'watery.' An instant flare of flame ignited the woodwork, and the fire quickly spread into the adjoining building.

A drying room for hides was arranged with a blower at one end to make a current of air along the room and thence outdoors through a vent at the other end. Fire started at a hot bearing on the blower, which blew the flames directly into the hides and fanned them along the room, destroying the entire stock. This hazardous setup followed naturally from the term 'blower' with its linguistic equivalence to 'that which blows,' implying that its function necessarily is to 'blow.' Also its function is verbalized as 'blowing air for drying,' overlooking that it can blow other things, e.g., flames and sparks. In reality a blower simply makes a current of air and can exhaust as well as blow. It should have been installed at the vent end to *draw* the air over the hides, then through the hazard (its own casing and bearings) and thence outdoors.

Beside a coal-fired melting pot for lead reclaiming was dumped a pile of 'scrap lead'—a misleading verbalization, for it consisted of the lead sheets of old radio condensers, which still had paraffin paper between them. Soon the paraffin blazed up and fired the roof, half of which was burned off.

Such examples, which could be greatly multiplied, will suffice to show how the cue to a certain line of behavior is often given by the analogies of the linguistic formula in which the situation is spoken of, and by which to some degree it is analyzed, classified, and allotted its place in that world which is 'to a large extent unconsciously built up on the language habits of the group.' And we always as-

sume that the linguistic analysis made by our group reflects reality better than it does.

Grammatical Patterns as Interpretations of Experience

The linguistic material in the above examples is limited to single words, phrases and patterns of limited range. One cannot study the behavioral compulsiveness of such material without suspecting a much more far-reaching compulsion from large-scale patterning of grammatical categories, such as plurality, gender and similar classifications (animate, inanimate, etc.), tenses, voices, and other verb forms, classifications of the type of 'parts of speech,' and the matter of whether a given experience is denoted by a unit morpheme, an inflected word, or a syntactical combination. A category such as number (singular vs. plural) is an attempted interpretation of a whole large order of experience, virtually of the world or of nature; it attempts to say how experience is to be segmented, what experience is to be called 'one' and what 'several.' But the difficulty of appraising such a far-reaching influence is great because of its background character, because of the difficulty of standing aside from our own language, which is a habit and a cultural *non est disputandum,* and scrutinizing it objectively. And if we take a very dissimilar language, this language becomes a part of nature, and we even do to it what we have already done to nature. We tend to think in our own language in order to examine the exotic language. Or we find the task of unraveling the purely morphological intricacies so gigantic that it seems to absorb all else. Yet the problem, though difficult, is feasible; and the best approach is through an exotic language, for in its study we are at long last pushed willy-nilly out of our ruts. Then we find that the exotic language is a mirror held up to our own.

In my study of the Hopi language, what I now see as an opportunity to work on this problem was first thrust upon me before I was clearly aware of the problem. The seemingly endless task of describing the morphology did finally end. Yet it was evident, especially in the light of Sapir's lectures on Navaho, that the description of the *language* was far from complete. I knew for example the morphological formation of plurals, but not how to use plurals. It was evident that the category of plural in Hopi was not the same thing as in English, French, or German. Certain things that were plural in these languages were singular in Hopi. The phase of investigation which now began consumed nearly two more years.

The work began to assume the character of a comparison between Hopi and western European languages. It also became evident that even the grammar of Hopi bore a relation to Hopi culture, and the grammar of European tongues to our own 'western' or 'European' culture. And it appeared that the interrelation brought in those large subsummations of experience by language, such as our terms 'time,' 'space,' 'substance,' and 'matter.' Since with respect to the traits compared there is little difference between English, French, German, or other European languages with the *possible* (but doubtful) exception of Balto-Slavic and non-Indo-European, I have lumped these languages into one group called SAE, or 'Standard Average European.'

That portion of the whole investigation here to be reported may be summed up in two questions: (1) Are our own concepts of 'time,' 'space,' and 'matter' given in substantially the same form by experience to all men, or are they in part conditioned

by the structure of particular languages? (2) Are there traceable affinities between (a) cultural and behavioral norms and (b) large-scale linguistic patterns? I should be the last to pretend that there is anything so definite as 'a correlation' between culture and language, and especially between ethnological rubrics such as 'agricultural,' 'hunting,' etc., and linguistic ones like 'inflected,' 'synthetic,' or 'isolating.'[1] When I began the study the problem was by no means so clearly formulated and I had little notion that the answers would turn out as they did.

Plurality and Numeration in SAE and Hopi

In our language, that is SAE, plurality and cardinal numbers are applied in two ways: to real plurals and imaginary plurals. Or more exactly if less tersely: perceptible spatial aggregates and metaphorical aggregates. We say 'ten men' and also 'ten days.' Ten men either are or could be objectively perceived as ten, ten in one group-perception[2]—ten men on a street corner, for instance. But 'ten days' cannot be objectively experienced. We experience only one day, to-day; the other nine (or even all ten) are something conjured up from memory or imagination. If 'ten days' be regarded as a group it must be as an 'imaginary,' mentally constructed group. Whence comes this mental pattern? Just as in the case of the fire-causing errors, from the fact that our language confuses the two different situations, has but one pattern for both. When we speak of ten steps forward, ten strokes on a bell, or any similarly described cyclic sequence, 'times' of any sort, we are doing the same thing as with 'days.' *Cyclicity* brings the response of imaginary plurals. But a likeness of cyclicity to aggregates is not unmistakably given by experience prior to language, or it would be found in all languages, and it is not.

Our *awareness* of time and cyclicity does contain something immediate and subjective—the basic sense of 'becoming later and later.' But in the habitual thought of us SAE people this is covered under something quite different, which though mental should not be called subjective. I call it *objectified,* or imaginary, because it is patterned on the *outer* world. It is this that reflects our linguistic usage. Our tongue makes no distinction between numbers counted on discrete entities and numbers that are simply counting itself. Habitual thought then assumes that in the latter case the numbers are just as much counted on *something* as in the former. This is objectification. Concepts of time lose contact with the subjective experience of 'becoming later' and are objectified as counted *quantities,* especially as lengths, made up of units as a length can be visible marked off into inches. A 'length of time' is envisioned as a row of similar units, like a row of bottles.

In Hopi there is a different linguistic situation. Plurals and cardinals are used only for entities that form or can form an objective group. There are no imaginary plurals, but instead ordinals used with singulars. Such an expression as 'ten days' is not used. The equivalent statement is an operational one that reaches one day by a suitable count. 'They stayed ten days' becomes 'they stayed until the eleventh

[1] We have plenty of evidence that this is not the case. Consider only the Hopi and the Ute, with languages that on the overt morphological and lexical level are as similar as, say, English and German. The idea of 'correlation' between language and culture, in the generally accepted sense of correlation, is certainly a mistaken one.

[2] As we say, 'ten at the *same* time,' showing that in our language and thought we restate the fact of group-perception in terms of a concept 'time,' the large linguistic component of which will appear in the course of this paper.

day' or 'they left after the tenth day.' 'Ten days is greater than nine days' becomes 'the tenth day is later than the ninth.' Our 'length of time' is not regarded as a length but as a relation between two events in lateness. Instead of our linguistically promoted objectification of that datum of consciousness we call 'time,' the Hopi language has not laid down any pattern that would cloak the subjective 'becoming later' that is the essence of time.

Nouns of Physical Quantity in SAE and Hopi

We have two kinds of nouns denoting physical things; individual nouns, and mass nouns, e.g., water, milk, wood, granite, sand, flour, meat. Individual nouns denote bodies with definite outlines: a tree, a stick, a man, a hill. Mass nouns denote homogeneous continua without implied boundaries. The distinction is marked by linguistic form; e.g., mass nouns lack plurals,[5] in English drop articles, and in French take the partitive article *du, de la, des*. The distinction is more widespread in language than in the observable appearance of things. Rather few natural occurrences present themselves as unbounded extents; air of course, and often water, rain, snow, sand, rock, dirt, grass. We do not encounter butter, meat, cloth, iron, glass, or most 'materials' in such kind of manifestation, but in bodies small or large with definite outlines. The distinction is somewhat forced upon our description of events by an unavoidable pattern in language. It is so inconvenient in a great many cases that we need some way of individualizing the mass noun by further linguistic devices. This is partly done by names of body-types: stick of wood, piece of cloth, pane of glass, cake of soap; also, and even more, by introducing names of containers though their contents be the real issue: glass of water, cup of coffee, dish of food, bag of flour, bottle of beer. These very common container-formulas, in which 'of' has an obvious, visually perceptible meaning ('contents'), influence our feeling about the less obvious type-body formulas: stick of wood, lump of dough, etc. The formulas are very similar: individual noun plus a similar relator (English 'of'). In the obvious case this relator denotes contents. In the inobvious one it *suggests* contents. Hence the lumps, chunks, blocks, pieces, etc., seem to contain something, a 'stuff,' 'substance,' or 'matter' that answers to the water, coffee, or flour in the container formulas. So with SAE people the philosophic 'substance' and 'matter' are also the naïve idea; they are instantly acceptable, 'common sense.' It is so through linguistic habit. Our language patterns often require us to name a physical thing by a binomial that splits the reference into a formless item plus a form.

Hopi is again different. It has a formally distinguished class of nouns. But this class contains no formal sub-class of mass nouns. All nouns have an individual sense and both singular and plural forms. Nouns translating most nearly our mass nouns still refer to vague bodies or vaguely bounded extents. They imply indefiniteness, but not lack, of outline and size. In specific statements 'water' means one certain mass or quantity of water, not what we call 'the substance water.' Gen-

[5] It is no exception to this rule of lacking a plural that a mass noun may sometimes coincide in lexeme with an individual noun that of course has a plural; e.g., 'stone' (no pl.) with 'a stone' (pl. 'stones'). The plural form denoting varieties, e.g., 'wines' is of course a different sort of thing from the true plural; it is a curious outgrowth from the SAE mass nouns, leading to still another sort of imaginary aggregates, which will have to be omitted from this paper.

erality of statement is conveyed through the verb or predicator, not the noun. Since nouns are individual already they are not individualized either by type-bodies or names of containers, if there is no special need to emphasize shape or container. The noun itself implies a suitable type-body or container. One says, not 'a glass of water' but ke·yi 'a water,' not 'a pool of water' but pa·he,[4] not 'a dish of corn-flour' but nǫ̈emni 'a (quantity of) corn-flour,' not 'a piece of meat' but sikʷi 'a meat.' The language has neither need for nor analogies on which to build the concept of existence as a duality of formless item and form. It deals with formlessness through other symbols than nouns.

Phases of Cycles in SAE and Hopi

Such terms as summer, winter, September, morning, noon, sunset, are with us nouns, and have little formal linguistic difference from other nouns. They can be subjects or objects, and we say 'at' sunset or 'in' winter just as we say at a corner or in an orchard.[5] They are pluralized and numerated like nouns of physical objects, as we have seen. Our thought about the referents of such words hence becomes objectified. Without objectification it would be a subjective experience of real time, i.e. of the consciousness of 'becoming later and later'—simply a cyclic phase similar to an earlier phase in that ever-later-becoming duration. Only by imagination can such a cyclic phase be set beside another and another in the manner of a spatial (i.e. visually perceived) configuration. But such is the power of linguistic analogy that we do so objectify cyclic phasing. We do it even by saying 'a phase' and 'phases' instead of, e.g., 'phasing.' And the pattern of individual and mass nouns, with the resulting binomial formula of formless item plus form, is so general that it is implicit for all nouns, and hence our very generalized formless items like 'substance,' 'matter,' by which we can fill out the binomial for an enormously wide range of nouns. But even these are not quite generalized enough to take in our phase nouns. So for the phase nouns we have made a formless item, 'time.' We have made it by using 'a time,' i.e. an occasion or a phase, in the pattern of a mass noun, just as from 'a summer' we make 'summer' in the pattern of a mass noun. Thus with our binomial formula we can say and think 'a moment of time,' 'a second of time,' 'a year of time.' Let me again point out that the pattern is simply that of 'a bottle of milk' or 'a piece of cheese.' Thus we are assisted to imagine that 'a summer' actually contains or consists of such-and-such a quantity of 'time.'

In Hopi however all phase terms, like summer, morning, etc., are not nouns but a kind of adverb, to use the nearest SAE analogy. They are a formal part of speech by themselves, distinct from nouns, verbs, and even other Hopi 'adverbs.' Such a word is not a case form or a locative pattern, like 'des Abends' or 'in the morning.' It contains no morpheme like one of 'in the house' or 'at the tree.'[6] It means

[4] Hopi has two words for water-quantities; ke·yi and pa·he. The difference is something like that between 'stone' and 'rock' in English, pa·he implying greater size and 'wildness'; flowing water, whether or not out-doors or in nature, is pa·he, so is 'moisture.' But unlike 'stone' and 'rock,' the difference is essential, not pertaining to a connotative margin, and the two can hardly ever be interchanged.

[5] To be sure there are a few minor differences from other nouns, in English for instance in the use of the articles.

[6] 'Year' and certain combinations of 'year' with name of season, rarely season names alone, can occur with a locative morpheme 'at,' but this is exceptional. It appears like historical detritus of an earlier different patterning, or the effect of English analogy, or both.

'when it is morning' or 'while morning-phase is occurring.' These 'temporals' are not used as subjects or objects, or at all like nouns. One does not say 'it's a hot summer' or 'summer is hot;' summer is not hot, summer is only *when* conditions are hot, *when* heat occurs. One does not say *'this* summer,' but 'summer now' or 'summer recently.' There is no objectification, as a region, an extent, a quantity, of the subjective duration-feeling. Nothing is suggested about time except the perpetual 'getting later' of it. And so there is no basis here for a formless item answering to our 'time.'

Temporal Forms of Verbs in SAE and Hopi

The three-tense system of SAE verbs colors all our thinking about time. This system is amalgamated with that larger scheme of objectification of the subjective experience of duration already noted in other patterns—in the binomial formula applicable to nouns in general, in temporal nouns, in plurality and numeration. This objectification enables us in imagination to 'stand time units in a row.' Imagination of time as like a row harmonizes with a system of *three* tenses; whereas a system of *two,* an earlier and a later, would seem to correspond better to the feeling of duration as it is experienced. For if we inspect consciousness we find no past, present, future, but a unity embracing complexity. *Everything* is in consciousness, and everything in consciousness *is,* and is together. There is in it a sensuous and a non-sensuous. We may call the sensuous—what we are seeing, hearing, touching—the 'present' while in the non-sensuous the vast image-world of memory is being labelled 'the past' and another realm of belief, intuition, and uncertainty 'the future;' yet sensation, memory, foresight, all are in consciousness together—one is not 'yet to be' nor another 'once but no more.' Where real time comes in is that all this in consciousness is 'getting later,' changing certain relations in an irreversible manner. In this 'latering' or 'durating' there seems to me to be a paramount contrast between the newest, latest instant at the focus of attention and the rest—the earlier. Languages by the score get along well with two tense-like forms answering to this paramount relation of later to earlier. We can of course *construct and contemplate in thought* a system of past, present, future, in the objectified configuration of points on a line. This is what our general objectification tendency leads us to do and our tense system confirms.

In English the present tense seems the one least in harmony with the paramount temporal relation. It is as if pressed into various and not wholly congruous duties. One duty is to stand as objectified middle term between objectified past and objectified future, in narration, discussion, argument, logic, philosophy. Another is to denote inclusion in the sensuous field: 'I *see* him.' Another is for nomic, i.e. customarily or generally valid, statements: 'We *see* with our eyes.' These varied uses introduce confusions of thought, of which for the most part we are unaware.

Hopi, as we might expect, is different here too. Verbs have no ' tenses' like ours, but have validity-forms ('assertions'), aspects, and clause-linkage forms (modes), that yield even greater precision of speech. The validity-forms denote that the speaker (not the subject) reports the situation (answering to our past and present) or that he expects it (answering to our future)[7] or that he makes a nomic statement

[7] The expective and reportive assertions contrast according to the 'paramount relation.' The expective expresses anticipation existing *earlier*

(answering to our nomic present). The aspects denote different degrees of duration and different kinds of tendency 'during duration.' As yet we have noted nothing to indicate whether an event is sooner or later than another when both are *reported*. But need for this does not arise until we have two verbs, i.e. two clauses. In that case the 'modes' denote relations between the clauses, including relations of later to earlier and of simultaneity. Then there are many detached words that express similar relations, supplementing the modes and aspects. The duties of our three-tense system and its tripartite linear objectified 'time' are distributed among various verb categories, all different from our tenses; and there is no more basis for an objectified time in Hopi verbs than in other Hopi patterns; although this does not in the least hinder the verb forms and other patterns from being closely adjusted to the pertinent realities of actual situations.

Duration, Intensity, and Tendency in SAE and Hopi

To fit discourse to manifold actual situations all languages need to express durations, intensities, and tendencies. It is characteristic of SAE and perhaps of many other language-types to express them metaphorically. The metaphors are those of spatial extension, i.e. of size, number (plurality), position, shape, and motion. We express duration by long, short, great, much, quick, slow, etc.; intensity by large, great, much, heavy, light, high, low, sharp, faint, etc.; tendency by more, increase, grow, turn, get, approach, go, come, rise, fall, stop, smooth, even, rapid, slow, and so on through an almost inexhaustible list of metaphors that we hardly recognize as such since they are virtually the only linguistic media available. The non-metaphorical terms in this field, like early, late, soon, lasting, intense, very, tending, are a mere handful, quite inadequate to the needs.

It is clear how this condition 'fits in.' It is part of our whole scheme of *objectifying*—imaginatively spatializing qualities and potentials that are quite non-spatial (so far as any spatially-perceptive senses can tell us). Noun-meaning (with us) proceeds from physical bodies to referents of far other sort. Since physical bodies and their outlines in *perceived space* are denoted by size and shape terms and reckoned by cardinal numbers and plurals, these patterns of denotation and reckoning extend to the symbols of non-spatial meanings, and so suggest an *imaginary space*. Physical shapes move, stop, rise, sink, approach, etc., in perceived space; why not these other referents in their imaginary space? This has gone so far that we can hardly refer to the simplest non-spatial situation without constant resort to physical metaphors. I 'grasp' the 'thread' of another's arguments, but if its 'level' is 'over my head' my attention may 'wander' and 'lose touch' with the 'drift' of it, so that when he 'comes' to his 'point' we differ 'widely,' our 'views' being indeed so 'far apart' that the 'things' he says 'appear' 'much' too arbitrary, or even 'a lot' of nonsense!

The absence of such metaphor from Hopi speech is striking. Use of space terms when there is no space involved is

than objective fact, and coinciding with objective fact *later* than the status quo of the speaker, this status quo, including all the subsummation of the past therein, being expressed by the reportive. Our notion 'future' seems to represent at once the earlier (anticipation) and the later (afterwards, what will be), as Hopi shows. This paradox may hint of how elusive the mystery of real time is, and how artificially it is expressed by a linear relation of past-present-future.

not there—as if on it had been laid the taboo teetotal! The reason is clear when we know that Hopi has abundant conjugational and lexical means of expressing duration, intensity, and tendency directly as such, and that major grammatical patterns do not, as with us, provide analogies for an imaginary space. The many verb 'aspects' express duration and tendency of manifestations, while some of the 'voices' express intensity, tendency, and duration of causes or forces producing manifestations. Then a special part of speech, the 'tensors,' a huge class of words, denotes only intensity, tendency, duration, and sequence. The function of the tensors is to express intensities, 'strengths,' and how they continue or vary, their rate-of-change; so that the broad concept of intensity, when considered as necessarily always varying and/or continuing, includes also tendency and duration. Tensors convey distinctions of degree, rate, constancy, repetition, increase and decrease of intensity, immediate sequence, interruption or sequence after an interval, etc., also *qualities* of strengths, such as we should express metaphorically as smooth, even, hard, rough. A striking feature is their lack of resemblance to the terms of real space and movement that to us 'mean the same.' There is not even more than a trace of apparent derivation from space terms.[8] So while Hopi in its nouns seems highly concrete, here in the tensors it becomes abstract almost beyond our own power to follow.

Habitual Thought in SAE and Hopi

The comparison now to be made between the habitual thought worlds of SAE and Hopi speakers is of course incomplete. It is possible only to touch upon certain dominant contrasts that appear to stem from the linguistic differences already noted. By 'habitual thought' and 'thought world' I mean more than simply language, i.e., than the linguistic patterns themselves. I include all the analogical and suggestive value of the patterns (e.g., our 'imaginary space' and its distant implications), and all the give-and-take between language and the culture as a whole, wherein is a vast amount that is not linguistic yet shows the shaping influence of language. In brief, this 'thought world' is the microcosm that each man carries about within himself, by which he measures and understands what he can of the macrocosm.

The SAE microcosm has analyzed reality largely in terms of what it calls 'things' (bodies and quasi-bodies) plus modes of extensional but formless existence that it calls 'substance' or 'matter.' It tends to see existence through a binomial formula that expresses any existent as a spatial form plus a spatial formless continuum related to the form as content is related to the outlines of its container. Non-spatial existents are imaginatively spatialized and charged with similar implications of form and continuum.

The Hopi microcosm seems to have analyzed reality largely in terms of *events*

[8] One such trace is that the tensor 'long in duration,' while quite different from the adjective 'long' of space, seems to contain the same root as the adjective 'large' of space. Another is that 'somewhere' of space used with certain tensors means 'at some indefinite time.' Possibly however this is not the case and it is only the tensor that gives the time element, so that 'somewhere' still refers to space and that under these conditions indefinite space means simply general applicability regardless of either time or space. Another trace is that in the temporal (cycle word) 'afternoon' the element meaning 'after' is derived from the verb 'to separate.' There are other such traces, but they are few and exceptional, and obviously not like our own spatial metaphorizing.

(or better 'eventing'), referred to in two ways, objective and subjective. Objectively, and only if perceptible physical experience, events are expressed mainly as outlines, colors, movements, and other perceptive reports. Subjectively, for both the physical and non-physical, events are considered the expression of invisible intensity-factors, on which depend their stability and persistence, or their fugitiveness and proclivities. It implies that existents do not 'become later and later' all in the same way; but some do so by growing, like plants, some by diffusing and vanishing, some by a procession of metamorphoses, some by enduring in one shape till affected by violent forces. In the nature of each existent able to manifest as a definite whole is the power of its own mode of duration; its growth, decline, stability, cyclicity, or creativeness. Everything is thus already 'prepared' for the way it now manifests by earlier phases, and what it will be later, partly has been, and partly is in act of being so 'prepared.' An emphasis and importance rests on this preparing or being prepared aspect of the world that may to the Hopi correspond to that 'quality of reality' that 'matter' or 'stuff' has for us.

Habitual Behavior Features of Hopi Culture

Our behavior, and that of Hopi, can be seen to be coordinated in many ways to the linguistically-conditioned microcosm. As in my fire case-book, people act about situations in ways which are like the ways they talk about them. A characteristic of Hopi behavior is the emphasis on preparation. This includes announcing and getting ready for events well beforehand, elaborate precautions to insure persistence of desired conditions, and stress on good will as the preparer of right results. Consider the analogies of the day-counting pattern alone. Time is mainly reckoned 'by day' (talk, -tala) or 'by night' (tok), which words are not nouns but tensors, the first formed on a root 'light, day,' the second on a root 'sleep.' The count is by *ordinals*. This is not the pattern of counting a number of different men or things, even though they appear successively, for even then they *could* gather into an assemblage. It is the pattern of counting successive reappearances of the *same* man or thing, incapable of forming an assemblage. The analogy is not to behave about day-cyclicity as to several men ('several days'), which is what *we* tend to do, but to behave as to the successive visits of the *same man*. One does not alter several men by working upon just one, but one can prepare and so alter the later visits of the same man by working to affect the visit he is making now. This is the way the Hopi deal with the future—by working within a present situation which is expected to carry impresses, both obvious and occult, forward into the future event of interest. One might say that Hopi society understands our proverb 'Well begun is half done,' but not our 'To-morrow is another day.' This may explain much in Hopi character.

This Hopi preparing behavior may be roughly divided into announcing, outer preparing, inner preparing, covert participation, and persistence. Announcing, or preparative publicity, is an important function in the hands of a special official, the Crier Chief. Outer preparing is preparation involving much visible activity, not all necessarily directly useful within our understanding. It includes ordinary practising, rehearsing, getting ready, introductory formalities, preparing of special food, etc. (all of these to a degree that may seem over-elaborate to us), intensive sustained muscular activity like running, racing, dancing, which is thought to increase

the intensity of development of events (such as growth of crops), mimetic and other magic, preparations based on esoteric theory involving perhaps occult instruments like prayer sticks, prayer feathers, and prayer meal, and finally the great cyclic ceremonies and dances, which have the significance of preparing rain and crops. From one of the verbs meaning 'prepare' is derived the noun for 'harvest' or 'crop:' na'twani 'the prepared' or the 'in preparation.'[9]

Inner preparing is use of prayer and meditation, and at lesser intensity good wishes and good will, to further desired results. Hopi attitudes stress the power of desire and thought. With their 'microcosm' it is utterly natural that they should. Desire and thought are the earliest, and therefore the most important, most critical and crucial, stage of preparing. Moreover, to the Hopi, one's desires and thoughts influence not only his own actions, but all nature. This too is wholly natural. Consciousness itself is aware of work, of the feel of effort and energy, in desire and thinking. Experience more basic than language tells us that if energy is expended effects are produced. *We* tend to believe that our bodies can stop up this energy, prevent it from affecting other things until we will our *bodies* to overt action. But this may be only because we have our own linguistic basis for a theory that formless items like 'matter' are things in themselves, malleable only by similar things, by more matter, and hence insulated from the powers of life and thought.. It is no more unnatural to think that thought contacts everything and pervades the universe than to think, as we all do, that light kindled outdoors does this. And it is not unnatural to suppose that thought, like any other force, leaves everywhere traces of effect. Now when *we* think of a certain actual rose-bush, we do not suppose that our thought goes to that actual bush, and engages with it, like a searchlight turned upon it. What then do we suppose our consciousness is dealing with when we are thinking of that rose-bush? Probably we think it is dealing with a 'mental image' which is not the rose-bush but a mental surrogate of it. But why should it be *natural* to think that our thought deals with a surrogate and not with the real rose-bush? Quite possibly because we are dimly aware that we carry about with us a whole imaginary space, full of mental surrogates. To us, mental surrogates are old familiar fare. Along with the images of imaginary space, which we perhaps secretly know to be imaginary only, we tuck the thought-of actually existing rose-bush, which may be quite another story, perhaps just because we have that very convenient 'place' for it. The Hopi thought-world has no imaginary space. The corollary to this is that it may not locate thought dealing with real space anywhere but in real space, nor insulate real space from the effects of thought. A Hopi would naturally suppose that his thought (or he himself) traffics with the actual rose-bush — or more like, corn-plant — that he is thinking about. The thought then should leave some trace of itself with the plant in the field. If it is a good thought, one about health and growth, it is good for the plant; if a bad thought, the reverse.

The Hopi emphasize the intensity-factor of thought. Thought to be most effective should be vivid in consciousness, definite, steady, sustained, charged with strongly-felt good intentions. They render the idea in English as 'concentrating,' 'hold it in your heart,' 'putting your mind to it,'

[9] The Hopi verbs of preparing naturally do not correspond neatly to our 'prepare'; so that na'twani could also be rendered 'the practised-upon,' 'the tried-for,' and otherwise.

'earnestly hoping.' Thought power is the force behind ceremonies, prayer-sticks, ritual smoking, etc. The prayer-pipe is regarded as an aid to 'concentrating' (so said my informant). Its name, na'twanpi, means 'instrument of preparing.'

Covert participation is mental collaboration from people who do not take part in the actual affair, be it a job of work, hunt, race, or ceremony, but direct their thought and good will toward the affair's success. Announcements often seek to enlist the support of such mental helpers as well as of overt participants, and contain exhortations to the people to aid with their active good will.[10] A similarity to our concepts of a sympathetic audience or the cheering section at a football game should not obscure the fact that is is primarily the power of directed thought, and not merely sympathy or encouragement, that is expected of covert participants. In fact these latter get in their deadliest work before, not during, the game! A corollary to the power of thought is the power of wrong thought for evil; hence one purpose of covert participation is to obtain the mass force of many good wishers to offset the harmful thought of ill wishers. Such attitudes greatly favor cooperation and community spirit. Not that the Hopi community is not full of rivalries and colliding interests. Against the tendency to social disintegration in such a small, isolated group, the theory of 'preparing' by the power of thought, logically leading to the great power of the combined, intensified and harmonized thought of the whole community, must help vastly toward the rather remarkable degree of cooperation that in spite of much private bickering the Hopi village displays in all the important cultural activities.

Hopi 'preparing' activities again show a result of their linguistic thought background in an emphasis on persistence and constant insistent repetition. A sense of the cumulative value of innumerable small momenta is dulled by an objectified, spatialized view of time like ours, enhanced by a way of thinking close to the subjective awareness of duration, of the ceaseless 'latering' of events. To us, for whom time is a motion on a space, unvarying repetition seems to scatter its force along a row of units of that space, and be wasted. To the Hopi, for whom time is not a motion but a 'getting later' of everything that has ever been done, unvarying repetition is not wasted but accumulated. It is storing up an invisible change that holds over into later events.[11] As we have seen, it is as if the return of the day were felt as the return of the same person, a little older but with all the impresses of yesterday, not as 'another day,' i.e. like an

[10] See, e.g., Ernest Beaglehole, *Notes on Hopi Economic Life* (Yale University Publications in Anthropology, No. 15, 1937), especially the reference to the announcement of a rabbit hunt, and on p. 30, description of the activities in connection with the cleaning of Toreva Spring —announcing, various preparing activities, and finally, preparing the continuity of the good results already obtained and the continued flow of the spring.

[11] This notion of storing up power, which seems implied by much Hopi behavior, has an analogue in physics, acceleration. It might be said that the linguistic background of Hopi thought equips it to recognize naturally that force manifests not as motion or velocity, but as cumulation or acceleration. Our linguistic background tends to hinder in us this same recognition, for having legitimately conceived force to be that which produces change, we then think of change by our linguistic *metaphorical* analogue, motion, instead of by a pure motionless changingness concept, i.e., accumulation or acceleration. Hence it comes to our naive feeling as a shock to find from physical experiments that it is not possible to define force by motion, that motion and speed, as also 'being at rest,' are wholly relative, and that force can be measured only by acceleration.

entirely different person. This principle joined with that of thought-power and with traits of general Pueblo culture is expressed in the theory of the Hopi ceremonial dance for furthering rain and crops, as well as in its short, piston-like tread, repeated thousands of times, hour after hour.

Some Impresses of Linguistic Habit in Western Civilization

It is harder to do justice in a few words to the linguistically-conditioned features of our own culture than in the case of the Hopi, because of both vast scope and and difficulty of objectivity—because of our deeply ingrained familiarity with the attitudes to be analyzed. I wish merely to sketch certain characteristics adjusted to our linguistic binomialism of form plus formless item or 'substance,' to our metaphoricalness, our imaginary space, and our objectified time. These, as we have seen, are linguistic.

From the form-plus-substance dichotomy the philosophical views most traditionally characteristic of the 'Western world' have derived huge support. Here belong materialism, psycho-physical parallelism, physics—at least in its traditional Newtonian form—and dualistic views of the universe in general. Indeed here belongs almost everything that is 'hard, practical common sense.' Monistic, holistic, and relativistic views of reality appeal to philosophers and some scientists, but they are badly handicapped for appealing to the 'common sense' of the Western average man. This is not because nature herself refutes them (if she did, philosophers could have discovered this much) but because they must be talked about in what amounts to a new language. 'Common sense,' as its name shows, and 'practicality' as its name does not show, are largely matters of talking so that one is readily understood. It is sometimes stated that Newtonian space, time, and matter are sensed by everyone intuitively, whereupon relativity is cited as showing how mathematical analysis can prove intuition wrong. This, besides being unfair to intuition, is an attempt to answer offhand question (1) put at the outset of this paper, to answer which this research was undertaken. Presentation of the findings now nears its end, and I think the answer is clear. The offhand answer, laying the blame upon intuition for our slowness in discovering mysteries of the cosmos, such as relativity, is the wrong one. The right answer is: Newtonian space, time, and matter are no intuitions. They are recepts from culture and language. That is where Newton got them.

Our objectified view of time is however favorable to historicity and to everything connected with the keeping of records, while the Hopi view is unfavorable thereto. The latter is too subtle, complex, and ever-developing, supplying no ready-made answer to the question of when 'one' event ends and 'another' begins. When it is implicit that everything that ever happened still is, but is in a necessarily different form from what memory or record reports, there is less incentive to study the past. As for the present, the incentive would be not to record it but to treat it as 'preparing.' But *our* objectified time puts before imagination something like a ribbon or scroll marked off into equal blank spaces, suggesting that each be filled with an entry. Writing has no doubt helped toward our linguistic treatment of time, even as the linguistic treatment has guided the uses of writing. Through this give-and-take between language and the whole culture we get, for instance:

1. Records, diaries, book-keeping, accounting, mathematics stimulated by accounting;

2. Interest in exact sequence, dating, calendars, chronology, clocks, time wages, time graphs, time as used in physics;

3. Annals, histories, the historical attitude, interest in the past, archaeology, attitudes of introjection towards past periods, e.g., classicism, romanticism.

Just as we conceive our objectified time as extending in the future like the way it extends in the past, so we set down our estimates of the future in the same shape as our records of the past, producing programs, schedules, budgets. The formal equality of the space-like units by which we measure and conceive time leads us to consider the 'formless item' or 'substance' of time to be homogeneous and in ratio to the number of units. Hence our prorata allocation of value to time, lending itself to the building up of a commercial structure based on time-prorata values: time wages (time work constantly supersedes piece work), rent, credit, interest, depreciation charges, and insurance premiums. No doubt this vast system once built would continue to run under any sort of linguistic treatment of time; but that it should have been built at all, reaching the magnitude and particular form it has in the Western world, is a fact decidedly in consonance with the patterns of the SAE languages. Whether such a civilization as ours would be possible with widely different linguistic handling of time is a large question—in our civilization our linguistic patterns and the fitting of our behavior to the temporal order are what they are, and they are in accord. We are of course stimulated to use calendars, clocks, and watches, and to try to measure time ever more precisely; this aids science, and science in turn, following these well-worn cultural grooves, gives back to culture an ever-growing store of applications, habits, and values, with which culture again directs science. But what lies outside this spiral? Science is beginning to find that there is something in the cosmos that is not in accord with the concepts we have formed in mounting the spiral. It is trying to frame a *new language* by which to adjust itself to a wider universe.

It is clear how the emphasis on 'saving time' which goes with all the above and is very obvious objectification of time, leads to a high valuation of 'speed,' which shows itself a great deal in our behavior.

Still another behavioral effect is that the character of monotony and regularity possessed by our image of time as an evenly scaled limitless tape measure persuades us to behave as if that monotony were more true of events than it really is. That is, it helps to routinize us. We tend to select and favor whatever bears out this view, to 'play up to' the routine aspects of existence. One phase of this is behavior evincing a false sense of security or an assumption that all will always go smoothly, and a lack in foreseeing and protecting ourselves against hazards. Our technique of harnessing energy does well in routine performance, and it is along routine lines that we chiefly strive to improve it—we are, for example, relatively uninterested in stopping the energy from causing accidents, fires, and explosions, which it is doing constantly on a wide scale. Such indifference to the unexpectedness of life would be disastrous to a society as small, isolated, and precariously poised as the Hopi society is, or rather once was.

Thus our linguistically-determined thought world not only collaborates with our cultural idols and ideals, but engages even our unconscious personal reactions in its patterns and gives them certain typical characters. One such character, as we have seen, is *carelessness*, as in reckless driving

or throwing cigarette stubs into waste paper. Another of different sort is *gesturing* when we talk. Very many of the gestures made by English-speaking people at least, and probably by all SAE speakers, serve to illustrate by a movement in space, not a real spatial reference but one of the non-spatial references that our language handles by metaphors of imaginary space. That is, we are more apt to make a grasping gesture when we speak of grasping an elusive idea than when we speak of grasping a doorknob. The gesture seeks to make a metaphorical and hence somewhat unclear reference more clear. But if a language refers to non-spatials without implying a spatial analogy, the reference is not made any clearer by gesture. The Hopi gesture very little, perhaps not at all in the sense we understand as gesture.

It would seem as if kinesthesia, or the sensing of muscular movement, though arising prior to language, should be made more highly conscious by linguistic use of imaginary space and methaphorical images of motion. Kinesthesia is marked in two facets of European culture: art and sport. European sculpture, an art in which Europe excels, is strongly kinesthetic, conveying great sense of the body's motions; European painting likewise. The dance in our culture expresses delight in motion rather than symbolism or ceremonial, and our music is greatly influenced by our dance forms. Our sports are strongly imbued with this element of the 'poetry of motion.' Hopi races and games seem to emphasize rather the virtues of endurance and sustained intensity. Hopi dancing is highly symbolic and is performed with great intensity and earnestness, but has not much movement or swing.

Synesthesia, or suggestion by certain sense receptions of characters belonging to another sense, as of light and color by sounds and *vice versa,* should be made more conscious by a linguistic metaphorical system that refers to non-spatial experiences by terms for spatial ones, though undoubtedly it arises from a deeper source. Probably in the first instance metaphor arises from synesthesia and not the reverse, yet metaphor need not become firmly rooted in linguistic pattern, as Hopi shows. Non-spatial experience has one well-organized sense, *hearing*—for smell and taste are but little organized. Non-spatial consciousness is a realm chiefly of thought, feeling, and *sound*. Spatial consciousness is a realm of light, color, sight, and touch, and presents shapes and dimensions. Our metaphorical system, by naming non-spatial experiences after spatial ones, imputes to sounds, smells, tastes, emotions, and thoughts qualities like the colors, luminosities, shapes, angles, textures, and motions of spatial experience. And to some extent the reverse transference occurs; for after much talking about tones as high, low, sharp, dull, heavy, brilliant, slow, the talker finds it easy to think of some factors in spatial experience as like factors of tone. Thus we speak of 'tones' of color, a gray 'monotone,' a 'loud' necktie, a 'taste' in dress; all spatial metaphor in reverse. Now European art is distinctive in the way it seeks deliberately to play with synesthesia. Music tries to suggest scenes, color, movement, geometric design; painting and sculpture are often consciously guided by the analogies of music's rhythm; colors are conjoined with feeling for the analogy to concords and discords. The European theatre and opera seek a synthesis of many arts. It may be that in this way our metaphorical language that is in some sense a confusion of thought is producing, through art, a result of far-reaching value —a deeper esthetic sense leading toward a more direct apprehension of underlying unity behind the phenomena so variously reported by our sense channels.

Historical Implications

How does such a network of language, culture, and behavior come about historically? Which was first, the language patterns or the cultural norms? In main they have grown up together, constantly influencing each other. But in this partnership the nature of the language is the factor that limits free plasticity and rigidifies channels of development in the more autocratic way. This is because a language is a system, not just an assemblage of norms. Large systemic outlines can change to something really new only very slowly, while many other cultural innovations are made with comparative quickness. Language thus represents the mass mind; it is affected by inventions and innovations, but affected little and slowly, whereas *to* inventors and innovators it legislates with the decree immediate.

The growth of the SAE language-culture complex dates from ancient times. Much of its metaphorical reference to the non-spatial by the spatial was already fixed in the ancient tongues, and more especially in Latin. It is indeed a marked trait of Latin. If we compare, say Hebrew, we find that while Hebrew has some allusion to not-space as space, Latin has more. Latin terms for non-spatials, like *educo, religio, principia, comprehendo,* are usually metaphorized physical references: lead out, tying back, etc. This is not true of all languages—it is quite untrue of Hopi. The fact that in Latin the direction of development happened to be from spatial to non-spatial (partly because of secondary stimulation to abstract thinking when the intellectually crude Romans encountered Greek culture) and that later tongues were strongly stimulated to mimic Latin, seems a likely reason for a belief which still lingers on among linguists that this is the natural direction of semantic change in all languages, and for the persistent notion in Western learned circles (in strong contrast to Eastern ones) that objective experience is prior to subjective. Philosophies make out a weighty case for the reverse, and certainly the direction of development is sometimes the reverse. Thus the Hopi word for 'heart' can be shown to be a late formation within Hopi from a root meaning think or remember. Or consider what has happened to the word 'radio' in such a sentence as 'he bought a new radio,' as compared to its prior meaning 'science of wireless telephony.'

In the middle ages the patterns already formed in Latin began to interweave with the increased mechanical invention, industry, trade, and scholastic and scientific thought. The need for measurement in industry and trade, the stores and bulks of 'stuffs' in various containers, the type-bodies in which various goods were handled, standardizing of measure and weight units, invention of clocks and measurement of 'time,' keeping of records, accounts, chronicles, histories, growth of mathematics and the partnership of mathematics and science, all coöperated to bring our thought and language world into its present form.

In Hopi history, could we read it, we should find a different type of language and a different set of cultural and environmental influences working together. A peaceful agricultural society isolated by geographic features and nomad enemies in a land of scanty rainfall, arid agriculture that could be made successful only by the utmost perseverance (hence the value of persistence and repetition), necessity for collaboration (hence emphasis on the psychology of teamwork and on mental factors in general), corn and rain as primary criteria of value, need of extensive *preparations* and precautions to as-

sure crops in the poor soil and precarious climate, keen realization of dependence upon nature favoring prayer and a religious attitude toward the forces of nature, especially prayer and religion directed toward the ever-needed blessing, rain—these things interacted with Hopi linguistic patterns to mold them, to be molded again by them, and so little by little to shape the Hopi world-outlook.

To sum up the matter, our first question asked in the beginning (p. 200) is answered thus: Concepts of 'time' and 'matter' are not given in substantially the same form by experience to all men but depend upon the nature of the language or languages through the use of which they have been developed. They do not depend so much upon *any one system* (e.g., tense, or nouns) within the grammar as upon the ways of analyzing and reporting experience which have become fixed in the language as integrated 'fashions of speaking' and which cut across the typical grammatical classifications, so that such a 'fashion' may include lexical, morphological, syntactic, and otherwise systematically diverse means coordinated in a certain frame of consistency. Our own 'time' differs markedly from Hopi 'duration.' It is conceived as like a space of strictly limited dimensions, or sometimes as like a motion upon such a space, and employed as an intellectual tool accordingly. Hopi 'duration' seems to be inconceivable in terms of space or motion, being the mode in which life differs from form, and consciousness *in toto* from the spatial elements of consciousness. Certain ideas born of our own time-concept, such as that of absolute simultaneity, would be either very difficult to express or impossible and devoid of meaning under the Hopi conception, and would be replaced by operational concepts. Our 'matter' is the physical sub-type of 'substance' or 'stuff,' which is conceived as the formless extensional item that must be joined with form before there can be real existence. In Hopi there seems to be nothing corresponding to it; there are no formless extensional items; existence may or may not have form, but what it also has, with or without form, is intensity and duration, these being non-extensional and at bottom the same.

But what about our concept of 'space,' which was also included in our first questions? There is no such striking difference between Hopi and SAE about space as about time, and probably the apprehension of space is given in substantially the same form by experience irrespective of language. The experiments of the Gestalt psychologists with visual perception appear to establish this as a fact. But the *concept of space* will vary somewhat with language, because as an intellectual tool[12] it is so closely linked with the concomitant employment of other intellectual tools, of the order of 'time' and 'matter,' which are linguistically conditioned. We see things with our eyes in the same space forms as the Hopi, but our idea of space has also the property of acting as a surrogate of non-spatial relationships like time, intensity, tendency, and as a void to be filled with imagined formless items, one of which may even be called 'space.' Space as sensed by the Hopi would not be connected mentally with such surrogates, but would be comparatively 'pure,' unmixed with extraneous notions.

As for our second question (p. 201): There are connections but not correlations or diagnostic correspondences between cultural norms and linguistic patterns. Although it would be impossible to infer the existence of Crier Chiefs from the lack of tenses in Hopi, or vice versa, there

[12] Here belong 'Newtonian' and 'Euclidean' space, etc.

is a relation between a language and the rest of the culture of the society which uses it. There are cases where the 'fashions of speaking' are closely integrated with the whole general culture, whether or not this be universally true, and there are connections within this integration, between the kind of linguistic analyses employed and various behavioral reactions and also the shapes taken by various cultural developments. Thus the importance of Crier Chiefs does have a connection, not with tenselessness itself, but with a system of thought in which categories different from our tenses are natural. These connections are to be found not so much by focusing attention on the typical rubrics of linguistic, ethnographic, or sociological description as by examining the culture and the language (always and only when the two have been together historically for a considerable time) as a whole in which concatenations that run across these departmental lines may be expected to exist, and if they do exist, eventually to be discoverable by study.

A NOTE ON WORD-MAGIC

[Joseph, speaking of a lion.] 'But if he had come, with lashing tail, and roared after his prey, like the voice of the chanting seraphim, yet thy child would have been little affrighted or not at all before his rage. . . . For knoweth not my father that the beasts fear and avoid man, for that God gave him the spirit of understanding and taught him the orders into which single things fall; doth he not know how Shemmael shrieked when the man of earth knew how to name the creation as though he were its master and framer . . . ? And the beasts too they are ashamed and put the tail between their legs because we know them and have power over their names and can thus render powerless the roaring might of the single one, by naming him. If now he had come, with long slinking tread, with his hateful nose, mewing and spitting, terror would not have robbed me of my senses, nor made me pale before his riddle. "Is thy name Blood-Thirst?" I would have asked of him, making merry at his expense. "Or Springing Murder?" But there I would have sat upright and cried out: "Lion! Lo, Lion art thou, by nature and species, and thy riddle lieth bare before me, so that I speak it out and with a laugh it is plain." And he would have blinked before the name and gone meekly away before the word, powerless to answer unto me. For he is quite unlearned and knows nought of writing tools.'

THOMAS MANN, *Joseph and His Brethren*

POETRY AND SCIENCE*

S. I. HAYAKAWA

'ONE of the illusions,' says Professor Thomas C. Pollock, 'from which the leaders, if not all the camp followers, of scientific thought have been freed is the pernicious belief that the physical world "revealed" by science is somehow more "real" than what Eddington ironically calls "transcendental" things like consciousness, beauty, and humor.'[1] The naïve deification of science and the consequent holding in contempt of other than scientific types of statement, although still adhered to by a few scientists and many nonscientists, are certainly no longer representative of the scientific attitude. Both scientific and linguistic theory are agreed as to what science does *not* do. Science deals with abstractions from experience, but does not describe experience itself. Those abstractions have been regarded, in some scientific circles but even more in popular apprehension, as being in some sense the realities themselves—the 'final truths.' Modern scientists, however, are among the first to admit, indeed to urge, that scientific statements, being statements at high levels of abstraction, leave out characteristics of the experiences or events talked about. To assume that science in any way says 'the last word' is to confuse the verbal 'map' with the experiential 'territory,' to ignore the omission of characteristics that is inevitable in any utterance, and to refuse to admit the possibility of other methods of 'mapping.'

Reporting scientific facts is by no means the only function of language. In the light of new semantic knowledge, or, as Professor C. W. Morris would say, in the light of any adequate theory of signs,[2] there can be no justification for selecting one or two language functions, for example the logical and the scientific, and labeling them 'good,' and saying that other language functions are 'useless' or 'bad.' Yet this is what traditional discussions have led us to: even English teachers, who are professionally concerned with nonscientific uses of language, have been carried along with everyone else in attributing the logical and scientific uses of language to the so-called 'intellectual faculties,' and the dynamic and artistic uses of language to the 'emotions.' Although 'intellect' and 'emotion' cannot be separated from each other in fact, they are constantly treated as independent entities, with disastrous results, not the least of which is the implication that 'emotions' are untrustworthy and misleading, while 'reason,' even when based upon uncritically derived abstractions, should invariably be obeyed.

Modern linguistic theory cuts right across that kind of nonsense, and in abolishing the dichotomy of 'intellect' and 'emotion,' it does something of enormous importance to us all as teachers and students of literature. Imprisoned as we are in the old language, it is difficult to say

* Reprinted by permission of Columbia University Press from *English Institute Annual, 1942* (1943), pp. 166-181.

[1] *The Nature of Literature*, Princeton University Press, 1942, p. 89.

[2] C. W. Morris, *Foundations of the Theory of Signs* (Vol. I, No. 2, of the *International Encyclopedia of Unified Science*), University of Chicago Press, 1938.

what one means without appearing to create even more difficulties than previously existed. But if, in spite of its misleading implications, I may use the old language for the needs of a rough-and-ready kind of statement, we can say that modern linguistic theory finds no invidious distinction between the 'language of the intellect'—science—and the 'language of the emotions'—poetry. The only differences it recognizes are differences of function. If, therefore, it can be shown from a scientific point of view that the functions performed by poetry are as much a part of the survival mechanism of human beings as the functions performed by science, there are no reasons science itself can give for putting itself above poetry as a more necessary or a more important study. Nor, contrariwise, can poetry be put above science. To raise the question at all of the primacy of one or the other is like asking, 'Which is more important, eating or breathing?'

What necessary survival functions does poetry perform? If we permit ourselves to be trapped in the traditional categories by virtue of which poetry is simply 'emotive language,' then what poetry deals with is not (to use I. A. Richards' expression) 'Thought in the strictest sense.' According to Mr. Richards, who is so trapped, 'Thought in the strictest sense' is 'thought' about 'referents.' Now since 'thought' about 'referents' is (when the whole question is put this way) apparently *the* important kind of 'thought,' poetry seems to be left with no basis for a serious claim to our attention.[3] This, of course, is a conclusion Mr. Richards does not relish, and he heroically tries to evade it. The unphilosophical man in the street, however, is restrained by no such scrupulous respect for the arts. Since what Mr. Richards calls 'Thought in the strictest sense'—'thought about things'—is obviously needed to run governments, railroads, hardware stores, and the rest of the serious business of life, the man in the street, obeying with more docility than Mr. Richards the intuitions to which traditional linguistic categories have led him, relegates the cultivation of poetry almost exclusively to women's clubs and English teachers. The answer, therefore, that one can expect from the average legislator, businessman, or workingman to the question, 'What survival functions does poetry perform?' is, of course, 'None at all.'

If on the other hand, we abandon the old approach—the approach in terms of what Korzybski has termed 'elementalistic' categories—in favor of a modern biological, organism-as-a-whole approach, we proceed on the assumption that anything a living creature does is in one way or another the result of the operation of its survival mechanism. Human beings, like other creatures, satisfy their needs for food, comfort, and the continuation of the species. But man has an immeasurably more complex nervous system than other creatures, and consequently achieves an immeasurably greater control over his environment. Central to human achievement, and, indeed, enabling it, in his power to use symbols. By means of phonetic symbolic representations he crystallizes his knowledge and his feelings; by the same means he socializes that knowledge or those feelings; by written symbolic representations he accumulates knowledge and passes it on to further generations of men. By dynamic (motivational) uses of symbols, he procures the

[3] For an analysis of this question, see Thomas C. Pollock's 'A Critique of I. A. Richards' Theory of Language and Literature,' and John Gordon Spaulding's 'Elementalism: the Effect of an Implicit Postulate of Identity on I. A. Richards' Theory of Poetic Value,' in *A Theory of Meaning Analyzed* (Monograph III, General Semantics Monographs), Chicago, 1942.

coöperation of his neighbors and imposes patterns upon their behavior. Every aspect of human behavior is conditioned and affected by operations of the symbolic process. Over and above all potentialities and capacities open to animals, man has, by virtue of the symbolic process, as Korzybski says:

> the capacity to summarize, digest and appropriate the labors and experience of the past; . . . the capacity to use the fruits of past labors and experiences as intellectual or spiritual capital for developments in the present; . . . the capacity to employ as instruments of increasing power the accumulated achievements of the . . . lives of the past generations spent in trial and error; . . . the capacity of human beings to conduct their lives in the ever increasing light of inherited wisdom; . . . the capacity in virtue of which man is at once the inheritor of the by-gone ages and the trustee of posterity.[4]

This symbolic activity adds an extra dimension to human life that animal life does not possess, and, as he says in addition: 'to treat a human being as an animal . . . because humans have certain animal propensities, is an error of the same type and grossness as to treat a cube as a surface because it has surface properties.'[5] When we observe, then, the operation of the symbolic process, and therefore of language, and its importance to human life, we can, still speaking biologically, see that in the performance of all biological functions, human beings, having that extra dimension, operate differently from animals. Animals know their environment by direct experience only. Human beings are not thus limited; they know infinitely more about their environment—that is, they have a bigger environment—because of language. In other words, all history, all geography, all that we know about current events beyond our immediate vision, are *not* part of an animal's environment, but are part of ours. Animals feed themselves where they find food, but man, employing symbols and thereby procuring coöperative endeavor, feeds himself abundantly and with food prepared by a hundred hands and brought from great distances. Animals exercise but limited control over each other, but man, again by employing symbols, establishes laws and ethical system, which are linguistic means of establishing order and predictability upon human conduct.

These are only some of the survival functions that man performs with the aid of language. To get back to the earlier question which necessitated this review of the facts of human functioning, What survival values, speaking in purely biological terms, has literature?

Having included under the general term 'literature' all the affective uses of language, including poetry, we find, not only as the result of insights of literary critics and scholars but also as the result of recent psychological and psychiatric investigation, that, from the point of view of the utterer, one of the most important functions of the utterance is the relieving of *tensions*. We have all known the relief that comes from uttering a long and resounding series of impolite vocables under the stress of great irritation. The same releasing of psychological tensions appears to be achieved at all levels of affective utterance, if we are to believe what writers themselves have said about the creative process. The novel, the drama, the poem, like the oath or the

[4] A. Korzybski, *The Manhood of Humanity*, New York, 1921, p. 59. Reprinted by permission of E. P. Dutton and Company, publishers.
[5] *Ibid.*, p. 60.

expletive, arise out of internal necessity when the organism experiences a serious tension, disturbance, or frustration. And, as a result of the utterances made, the tension, disturbance, or frustration is, to a greater or less degree and perhaps only temporarily, mitigated.

A frustrated or disturbed animal can do little about its disturbance.[6] A human being, however, with an extra dimension to move around in, can employ a variety of 'symbolic strategies' (to use Kenneth Burke's phrase)[7] to 'encompass' his situation—in other words, to get the cause of his disturbance in some way or other symbolically under control. Or, by other symbolic strategies, instead of 'encompassing' his situation, he may escape from it by imagining himself elsewhere and by substituting a symbolic (or dream) life for the actual one which he cannot face. Any of these strategies help the human being survive by enabling him to tolerate the intolerable. 'Pouring out one's heart' is, as we all know, whether in speech or in poetry, often the alternative to suicide or insanity—admittedly not always a successful alternative—but nevertheless available as a mechanism of relief when the pressures of a situation become unbearable.

But, as we all know, language is social, and for every speaker there may be hearers. The result is that an utterance that relieves a tension for the speaker can relieve a similar tension, should one happen to exist, in a hearer. There is enough similarity in human experience in all times and cultures, apparently, so that the symbolic manipulation by which John Donne, for example, 'encompassed' his feelings of guilt in one of his holy sonnets enables us too, at another time and under another set of circumstances, to encompass our own sense of guilt about, in all probability, a different set of sins.

Poetry has often been spoken of as an aid to sanity. It appears that we can take this statement seriously and work out its implications in many directions. What are, for example, some of the kinds of symbolic manipulation by which we attempt to adjust ourselves to the constant succession of difficulties and disturbances, great and small, that confront us day by day and hour by hour?

First of all, of course, there is what is called literary 'escape'—a tremendous source of literature, poetry, drama, comic strips, and other forms of affective communication. Edgar Rice Burroughs, confined to a sickbed, symbolically traipsed through the jungle, in the person of Tarzan, in a series of breath-taking and triumphant adventures—and by means of this symbolic compensation made his sickbed endurable. At the same time he made life endurable for millions of undersized, frustrated, and feeble people. Whatever one may think of the author and the readers of the Tarzan stories, I wish to emphasize that in order to derive what shabby relief they offer from pain or boredom, it takes, both in the telling and in the reading of such stories, the symbolic process, and hence a *human* nervous system.

Let us take another example of symbolic strategy. When an angry or disgruntled employee calls his employer a 'half-pint Hitler,' is he not, in crude fashion, using a strategy which, by means

[6] See the account of the 'substitutive, or symbolic' behavior of cats under conditions of experimentally induced neurosis in Jules Masserman's *Behavior and Neurosis*, University of Chicago Press, 1943. It can hardly be denied, in the face of Dr. Masserman's evidence, that an extremely rudimentary form of what might be called 'pre-poetic' behavior, analogous to the treasuring of a lock of a loved one's hair, is to be found even among cats.

[7] Kenneth Burke, *The Philosophy of Literary Form*, Louisiana State University Press, 1941.

of introducing his employer (a petty tyrant) into a perspective which includes Hitler (a great tyrant), symbolically reducing his employer to, as Kenneth Burke would say, manageable proportions? And did not Dante likewise, unable to punish his enemies as they deserved to be punished, symbolically put in their places in the most uncomfortable quarters in Hell? There is a world of difference between the completeness and adequacy of such a simple epithet as 'half-pint Hitler' and Dante's way of disposing of his enemies, but are they not both symbolic manipulations by means of which the utterers derive a measure of relief, or relaxation of psychological tensions?

Let us take another example. Upton Sinclair could not adjust himself to the stockyards as they were in 1906. One thing he could have done would have been to try to forget it; he could have buried himself in reading or writing about other things, such as idyllic lands long ago and far away or entirely nonexistent —as do the readers and writers of escape literature. Another thing he could have done would have been, by a different symbolic manipulation, to show that present evil was part of greater good 'in God's omniscient plan.' This has been the strategy of many religions as well as of many authors. Still another possibility would have been actually to reform conditions at the stockyards so that he could contemplate them with equanimity—but he would have had to be a big official in a packing company or in the government to do that. What he did, therefore, was to socialize his maladjustment—to pass it on to others—on the very good theory that if enough people felt angry or disgusted with the situation, they could collectively change the stockyards in such a way that one could adjust onself to them.

Let us not be frightened away by what some of us regard with distaste as the jargon of psychologists and sociologists, such words as adjustment and maladjustment, compensations, tension, and the rest. Adjustment, as modern psychology sees the process, is no static condition of Babbitt-like and unreflective bliss that comes from fitting uncritically into any environment. It is a dynamic, day-to-day, moment-to-moment process, and it involes changing the environment to suit one's own personality as much as it involves adapting one's feelings to existing conditions. The greater resources one has for achieving and maintaining adjustment, the more successful will the process be.

Both the enjoyment and the production of poetry and literature, then, being human symbolic devices employed in the day-to-day process of maintaining adjustment, are extensions of our adjustment mechanism beyond those provided for us by that part of our biological equipment which we have in common with lower animals. If a man were to spend years of his life trying to discover the chemical constituency of salt water *without* bothering to find out what has already been said on the subject in any elementary chemistry book, we should say that he was making very imperfect use of the resources which our symbolic systems have made available to us. Similarly, can it not be said that people, worrying themselves sick over their individual frustrations, constantly suffering from nervous tics, petty irritations, hypertensions, or, in more serious cases, high blood pressure, are often making extremely imperfect use of the available human resources of adjustment?

What all this boils down to, then, is that poetry (along with the other arts), whether it be good or bad and at whatever level of crudity or refinement, exists to fulfill a necessary biological function for

the human class of life, that of helping us to maintain sanity. This has been stated in a hundred ways, but the implications of the statement have not been followed through, and it is to urge a new direction in scholarship, teaching, and research that I address you now. In spite of all that has been written about the 'sanative,' 'purging,' and 'cleansing' influence of great literature, the notion of joining forces with psychologists and psychiatrists in order to work out the implications of such terms proves upsetting to those who look upon anything like a psychiatric approach as applying only to a special class of people 'diseased' or 'possessed' through the workings of malignant forces unknown to the 'sane.' Psychiatrists, however, recognize no such distinct 'classes' of the 'sane' and the 'unsane.' Sanity is a matter of degree, and 'sane' people are all capable of becoming more sane, or less, according to the experiences they encounter and the strength and flexibility of the internal equipment with which they meet them. The degree of sanity which one enjoys, therefore, has to be maintained in the very course of living, even as one's physical health has to be maintained. Under these circumstances, is it not possible to give stronger pragmatic grounds for 'teaching students to read good books' than we have ever been able to offer? Can we not argue demonstrably that literature is one of the instruments of a generalized 'mental hygiene'?

Such an approach automatically solves a large number of pedagogical and critical dilemmas. Certain kinds of literature, like certain kinds of processed and manufactured food, can be said to look very much like nourishment, but to contain none of the essential vitamin ingredients, so that great quantities can be consumed without affecting one's spiritual undernourishment. Certain kinds of popular fiction claim to help the reader overcome given problems in life—stories with such titles as 'The Office Wife—Was She Playing Fair?'—but, like patent medicines, these offer apparent soothing to surface symptoms, and leave underlying causes undealt with. Other kinds of fiction, like drugs and liquor, offer escape from pain, and again leave causes untouched, so that the more of them you take, the more you need. The result of this narcotic literature is fantasy-living—schizophrenia—and if it becomes too serious, the patient has to be locked up. Still other kinds of fiction, movies, radio stories, and the like, give a false, prettified picture of the world—a world that can be adjusted to *without effort*. But readers who adjust themselves to this unreal world naturally become progressively less adjusted to the world as it is.

These are admittedly oversimplified examples, and it would be a disaster to apply this principle too crudely. An immediate temptation that some might see in this principle would be to say that, if literature is an instrument for attaining sanity, the writings of many not-too-sane geniuses will have to be thrown out as unhealthy. My own conclusion would be far from this. The symbolic strategies devised by extremely tortured people like Dostoevski or Donne or Shelley for the encompassing of their situations are valuable in the extreme. They mixed themselves powerful medicines against their ills, and their medicines not only help us to encompass whatever similar tortures we may be suffering from, but may serve also as anti-toxins lest we in future have occasion so to suffer.

Both psychiatrists and literary neohumanists have put great stress on the similarity of human beings in all cultures and at all times. The 'universals' that humanists talk about can be regarded, from

a psychiatric point of view, as generalizations about human nervous functionings. Looking at literature in his way, then, we can see how the insights of literary critics can be restated in scientific terms. When a work of literature is said to be 'permanent,' 'lasting,' or 'great,' does it not mean that the symbolic strategy by which the author encompassed his disturbance (achieved his adjustment) works for other people troubled by other disturbances at other times and places? Is it possible, for example, to read Sinclair's strategic handling of the Chicago stockyards without awareness that it applies more or less adequately to other people's disturbances about factory workers in Turin, or Manchester, or Kobe, or Montreal? And if it applies especially well to, say, Detroit, does not the Detroiter regard Sinclair as a great author? And if, under changing conditions, there are no longer social situations which arouse similar disturbances, do we not consider the author to be 'dated,' if not 'dead'? But if an author has adequately dealt with disturbances that people under all times and conditions appear to experience, do we not call his writings 'universal' and 'undying'?

I personally have only begun speculations in this direction, and can only delineate the crude outlines of the possibilities. But I should like you to consider the act that if people persist (as, in the working world, most people do, including businessmen, housewives, and legislators, and others who have power over our professional destinies) in their opinion that literature is a nonessential luxury whose principal social function is to keep women's clubs occupied in the afternoons, then, as the national danger grows, there will be increasing likelihood that we, as students and teachers of literature, will be pushed aside in favor of what are considered more necessary pursuits. All of us here are deeply enough convinced of the profound need for literature in human life. All of us have felt, even if we have not always been able to prove, that disastrous human consequences can arise from the consumption of such literary fare as is offered in the movies, the radio, and the popular magazines. Is it not possible that, if we approach our problem from the 'mental-hygiene' point of view, we as students of literature may some day know enough about the *effects* of literature so that we can *prescribe,* in the interests of everyday sanity and for everybody, certain kinds of imaginative writings as conducive to the maintenance of mental health? Would it not be possible to say, against a background of ascertained facts obtained from research into the effects of literature, *'Don't* read that magazine'—meaning, 'it will make you an even worse mental case than you are already!'

We have shunned this kind of inquiry, partly because of professional traditionalism, partly because some of us have never thought of it, partly because we have troubles enough already, but in great part because we have been appalled by some of the crude and uncomprehending remarks that have been made about literature by some psychologists, social scientists, and others imperfectly familiar with the literary or other artistic and creative processes. But, under the pressure of present circumstances, it is now our obligation not to shun what the sciences can offer us in the validation of our efforts, but to acquaint ourselves thoroughly with what there is in contemporary science that is relevant to our tasks of literary teaching and interpretation. Too many of us are fighting a 'scientific materialism' that science itself has outgrown for decades. Too many of us, preoccupied with the

beautiful adventures of our souls among masterpieces, are ignoring the light that psychiatry and psychology throw upon the nature of those adventures.

If we review the recent professional articles and addresses in justification of our activities, we find that nothing is being said that has not been said before. Literature, they say, preserves the best that is known and thought in the world. Literature, they say, is the noblest expression of the human spirit. Literature, they say, is the ultimate repository of human ideals. I do not question the truth of these statements. Indeed, I agree with them wholeheartedly. Nevertheless, would it be rude to point out that from a semantic point of view these are 'purr-words' about literature, and not at all the scientific, 'objectively' verifiable statement that is the only kind nowadays to command universal assent? We will get nowhere by continuing as usual to purr about how nice our subject matter is. If we cannot show that training in literature and in literary discrimination is just as necessary as training in health, an essential activity and not merely some fancy beadwork on the surface texture of our civilization, then our professional goose is cooked for a long time to come.

Unknown to the majority of us who were trained within the narrower definitions of literary scholarship customary in our graduate schools for the past few decades, many branches of science are offering new insights into man's symbolic functioning, and therefore into the literary process. These insights have been made possible through the work of anthropologists, studying such matters as the relationship of primitive language to primitive customs, of huntings songs to hunting, of magical ritual to tribal behavior. Other insights into the symbolic process have been given us by the social psychologists studying the function of 'myths,' modern and primitive, in the social organization. Other social psychologists, by the examination of public responses to radio programs and advertising, have begun to accumulate vast stores of material on the effects of imaginative representations on human life. Further light on the symbolic process has been shed by students of linguistics, who are destroying one by one the still current public misconceptions about language, and are substituting in their place facts based not only on the more accurate knowledge of our own language, but upon the study of many languages outside the Indo-European family. Mathematicians and logicians have also contributed to our understanding of the symbolic process by their sharp discriminations, as among the Logical Positivists, of the functions of language. The psychoanalysts have an entire literature on symbolism in their sense of the word, a sense which is closely allied to that in which literary criticism uses it. In the general semantics of Alfred Korzybski, we are offered a general 'theory of evaluation,' which serves not only as a basis for the unification of our knowledge of human symbolic behavior, but also enables the determination of criteria by which we may judge, first, with respect to specific literary productions, what responses on the reader's part are valid and what responses betray evidences of semantic malfunctioning, and secondly, with respect to literature as a whole, what kinds of literature promote what kinds of sane or unsane semantic reactions.

The contributions of each of these sciences, as well as of many others, all serve to throw light on how symbolism works, and, what is more to the purpose for us as students of literature, how imaginative symbolism works and what it

does for us. We ought to utilize this new knowledge, not simply because the findings of these scientists can help us in our tasks, but also because they can profit by our help. No psychology, behavioristic or otherwise, that purports to deal with man can omit an account of man's symbolic behavior. No account of man's symbolic behavior can be complete without an account of how poetic symbolization works and what functions it performs. If the psychologists and other scientists cannot turn to us for this information crucially necessary to the formulation of a science of man, to whom shall they turn?

The writer was recently informed that price-fixing by the government was unsound in principle. He replied that the cling peach license in California seemed to have benefited the industry through price-fixing. The answer was made that it was only temporary and would not work in the long run; therefore the principle was bad. The word 'artificial' is applied to any economic advantage arrived at in a new way. The idea is deeply imbedded that the only 'natural' rise in price is one that has occurred without governmental action. It is better to suffer under a sound principle than to thrive under an unsound one.

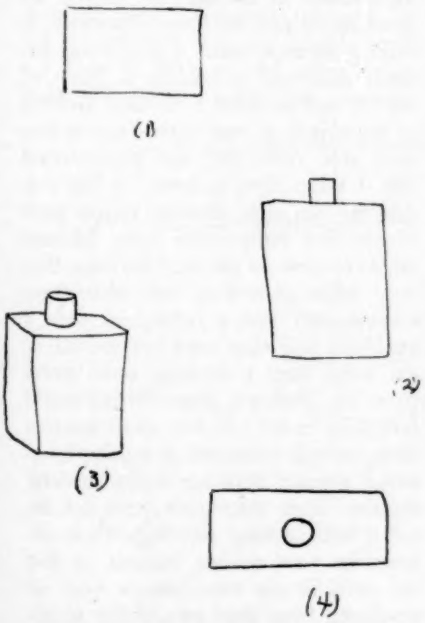
It is by means of this naïve set of concepts that economics and the law keep separated from each other and avoid the consideration of institutions as they are. Law schools escape studying the actual habits of judicial institutions. Schools of economics ignore the complex character of political institutions. They are able to do this by separating political from economic facts. For example, an economist who opposed the recent gold-purchase plan was asked if he had considered the effect of the plan on the farm strike. He replied that this was a political consideration and not an element in an economic judgment. The theory is that persons in power should follow sound economic principles and disregard mere political considerations. They should never follow sound political principles and disregard mere economic considerations. The fact that the latter method keeps politicians in power is simply a proof of the perversity of human nature, not a justification for giving paramount weight to political considerations. There follows from this the never-ending but always futile crusade by our best minds to take politicians out of politics by raising the character level of people in general.

THURMAN W. ARNOLD, *The Symbols of Government* (1935)

IMPROVING SEMANTIC REACTIONS THROUGH ART EDUCATION

JANICE VANCE KENT[1]

FOR some time I have been interested in the ways in which I could, through the teaching of art, help students acquire more adequate semantic reactions. After comparing different approaches, I decided to use contour drawing as a means of introduction to this training. Contour drawing is defined by Rosabelle MacDonald in *Art as Education* as 'an even, continuous drawing in which the edge is set down for its own sake, for what it tells without concern for form or composition in a space.' The objectives of the lesson were to train students to observe and to make true-to-fact statements of their observations.



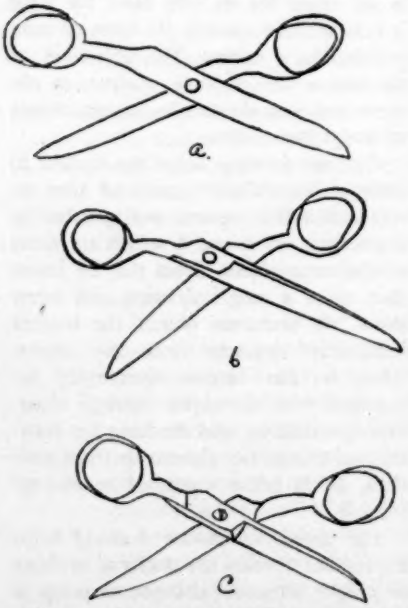
Contour drawing helps the student to observe that different points of view result in different reports, as illustrated by drawings *1*, *2*, *3*, and *4*, which are views of the same object. From this he learns that, since a single drawing can never show 'all' about an object, the student necessarily abstracts from the object. After he has become thoroughly acquainted with the object through observation, recording, and checking his drawings for true-to-fact statements from positions, he is better equipped to abstract from it.

The lesson in contour drawing helps the student develop the ability to evaluate *in proper sequence* and not to jump at conclusions. The first attempt at this type of drawing shows up quite plainly those who have the habits of jumping at conclusions. Some do not even attempt to observe the model, but take one look at it and make a statement which might be recognized as representing the object but is a false report as far as details are concerned. Such false reports present the opportunity to tell the students that in order to make a true-to-fact statement, they must first become acquainted with the object, silently studying the contour

[1] Director of Art Education, State Teachers College, Radford, Virginia.

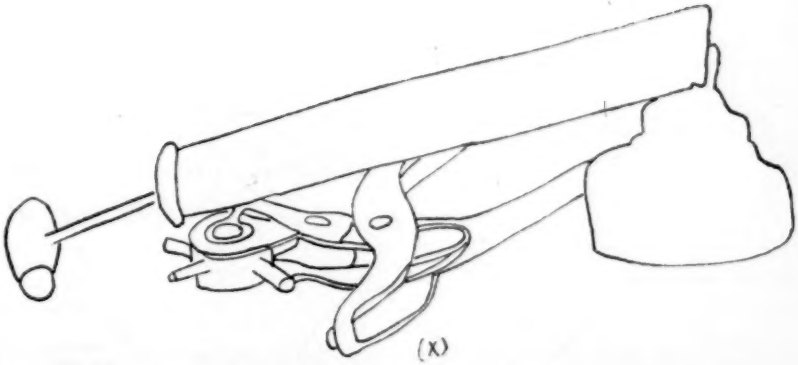
and analyzing it before they attempt to make a drawing. Then I suggest that they look at the drawing they have made and check and compare it with the model and try to discover for themselves where they have made a false statement.

Those who follow these directions show marked improvement in their next attempt. For some it takes more time, but when they finally do follow this suggestion, all with whom I have experimented begin to make truer statements. When they ask me to tell them what is wrong, I have them check their drawing with the object and in this way they are able to point out to me the errors they made. Drawings *a*, *b*, and *c* show progressive statements made by the same student, showing a development of a keener observation of facts.



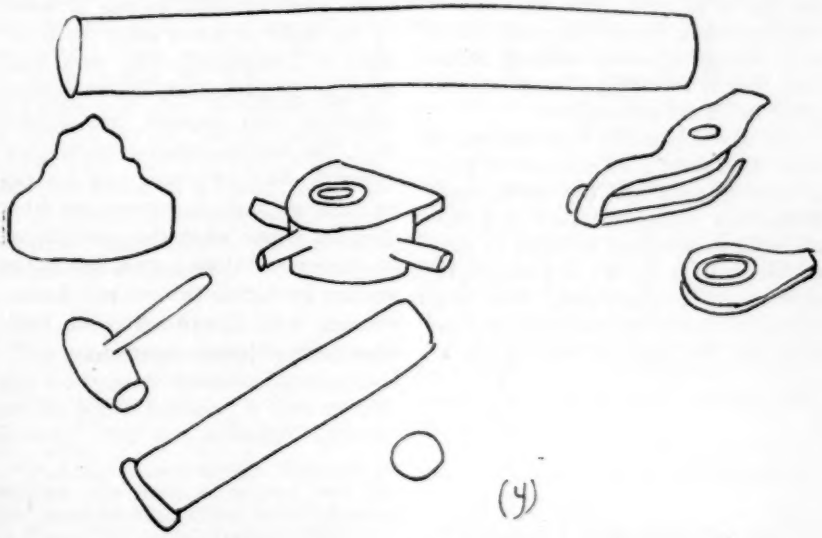
Teachers who believe in sentimental versions of the 'creative approach' to art teaching might at this point ask, 'Why is it important to make a true-to-fact statement? Does not that as an objective kill the creativeness of the student and make him academic in his method?' In reply to such objection I should say that a keen observation of facts *helps* initiative and creativeness. A student in art becomes *more* creative *after* analyzing an object, becoming acquainted with it, and making statements about it from as many points of view as possible. After drawing an object in many positions, he learns that a photographic reproduction of an object does not begin to show 'all' about an object, but that it only gives one point of view. He learns that he can abstract from an object and combine drawings of the same object from different points of view and create new design elements.

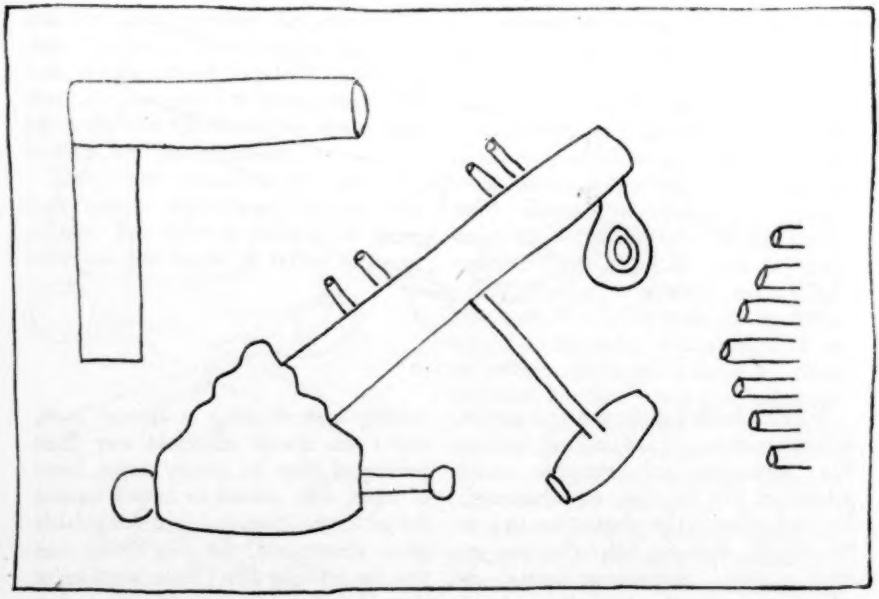
I asked a group of students entirely inexperienced in the field of modern abstract art to give me their coöperation in making an experiment. I gave these students directions to arrange a group of objects and to make a contour drawing of the objects as true to the facts as they were able. After they had accomplished this, I asked them to break up this first drawing into units, showing various parts of the first composition from different points of view. In the third drawing, they were asked to arrange and relate these various units into a rectangular area. I explained that they need not use all of the units, since a drawing could never show 'all.' Naturally characteristics would invariably be left out. The result was that these students succeeded in making interesting 'abstract' drawings in the 'modern' manner. Since these girls were not familiar with abstract paintings, these abstractions were entirely original, in that the units in the compositions were all developed from their own ability to observe and analyze. Drawings *x*, *y*, and *z* illustrate the procedure.



We then looked at the abstractions first without referring to the original 'true-to-fact' statement, and everyone could plainly see that the more one abstracted, less resemblance the abstraction had to the original drawing. *Since they had arrived at these abstractions through an orderly sequence, they understood them.*[2]

I have in the past had other classes make attempts at 'abstractions,' *without starting with anything to abstract from,* and I was always impressed with their poverty of ideas for design shapes. Some of them, who seemed to have a natural design sense, succeeded in making fairly good 'abstractions,' but they always said that the drawing didn't mean anything to them. I found, however, that when they had arrived at abstractions from true-to-fact statements and statements from vari-





(2)

ous points of view, there was none of this confusion, because they had arrived at it through a *natural* order of evaluation, thereby exhibiting at once what we call creativeness and initiative.

The next step in this procedure was to show them some good examples of modern abstract paintings. After having made abstractions using the above approach, my students were not bothered as most people are about the lack of photographic qualities in an abstraction. They have sensed that this is not important since the artist has the choice of making use of many points of view, no one of which 'is' the object, no one of which shows 'all' about it. Consequently they were much less upset by 'modern art,' more effectively delayed in their reactions, than students were who had not experienced this new approach. Such improved reactions can be made to apply to experiences other than the artistic when the *generality* of the processes involved is made clear to the students by further lectures and demonstrations, with illustrations drawn from other facets of human experience.

THE SYMBOL:

The Origin and Basis of Human Behavior

LESLIE A. WHITE*

I

IN JULY, 1939, a celebration was held at Leland Stanford University to commemorate the hundredth anniversary of the discovery that the cell is the basic unit of all living tissue. Today we are beginning to realize and to appreciate the fact that the symbol is the basic unit of all human behavior and civilization.

All human behavior originates in the use of symbols. It was the symbol which transformed our anthropoid ancestors into men and made them human. All civilizations have been generated, and are perpetuated, only by the use of symbols. It is the symbol which transforms an infant of homo sapiens into a human being; deaf mutes who grow up without the use of symbols are not human beings. All human behavior consists of, or is dependent upon, the use of symbols. Human behavior is symbolic behavior; symbolic behavior is human behavior. The symbol is the universe of humanity.

II

The great Darwin declared that 'there is no fundamental difference between man and the higher mammals in their mental faculties,' that the difference between them consists 'solely in his [man's] almost infinitely larger power of associating together the most diversified sounds and ideas,' (Ch. III, *The Descent of Man*). Thus the difference between the mind of man and that of other mammals is merely one of degree, and it is not 'fundamental.'

Essentially the same views are held by many present day students of human behavior. Professor Ralph Linton, an anthropologist, writes in *The Study of Man*:[1] 'The differences between men and animals in all these [behavior] respects are enormous, but they seem to be differences in quantity rather than in quality,' (p. 79; the same same idea is also expressed on p. 68). 'Human and animal behavior can be shown to have so much in common,' Professor Linton observes, 'that the gap [between them] ceases to be of great importance,' (p. 60). Dr. Alexander Goldenweiser, likewise an anthropologist, believes that 'In point of sheer psychology, mind as such, man is after all no more than a talented animal' and 'that the difference between the mentality here displayed [by a horse and a chimpanzee] and that of man is merely one of degree.'[2]

That there are numerous and impressive similarities between the behavior of

* Professor of Anthropology, University of Michigan. His article is reprinted, with the kind permission of the editors, from *Philosophy of Science*, VII, 451-463 (October 1940).

[1] New York, 1936.

[2] *Anthropology*, p. 39; New York, 1937.

man and that of ape is fairly obvious; it is quite possible that even chimpanzees in zoos have noted and appreciated them. Fairly apparent, too, are man's behavioral similarities to many other kinds of animals. Almost as obvious, but not easy to define, is a difference in behavior which distinguishes man from all other living creatures. I say 'obvious' because it is quite apparent to the common man that the non-human animals with which he is familiar do not and cannot enter, and participate in, the world in which he, as a human being, lives. It is impossible for a dog, horse, bird, or even an ape, ever to have *any* understanding of the meaning of the sign of the cross to a Christian, or of the fact that black (white among the Chinese) is the color of mourning. But when the scholar attempts to *define* the mental difference between animal and man he sometimes encounters difficulties which he cannot surmount and, therefore, ends up by saying that the difference is merely one of degree: man has a bigger mind, 'larger power of association,' wider range of activities, etc.[3]

There is a *fundamental* difference between the mind of man and the mind of non-man. This difference is one of kind, not one of degree. And the gap between the two types is of the greatest importance—at least to the science of comparative behavior. Man uses symbols; no other creature does. A creature either uses symbols or he does not; there are no intermediate stages.

III

A symbol is a thing the value or meaning of which is bestowed upon it by those who use it. I say 'thing' because a symbol may have any kind of physical form; it may have the form of a material object, a color, a sound, an odor, a motion of an object, a taste.

The meaning, or value, of a symbol is in no instance derived from or determined by properties intrinsic in its physical form: the color appropriate to mourning may be yellow, green, or any other color; purple need not be the color of royalty; among the Manchu rulers of China it was yellow. The meaning of the word 'see' is not intrinsic in its phonetic (or pictorial) properties. 'Biting one's thumb at'[4] someone might mean anything. The meanings of symbols are derived from and determined by the organisms who use them; meaning is bestowed by human organisms upon physical forms which thereupon become symbols.[5]

[3] We have a good example of this in the distinguished physiologist, Anton J. Carlson. After taking note of 'man's present achievements in science, in the arts (including oratory), in political and social institutions,' and noting 'at the same time the apparent paucity of such behavior in other animals,' he, as a common man 'is tempted to conclude that in these capacities, at least, man has a qualitative superiority over other mammals,' ('The Dynamics of Living Processes,' in *The Nature of the World and Man*, H. H. Newman, ed., p. 477; Chicago, 1926). But, since, as a scientist, Professor Carlson cannot *define* this qualitative difference between man and other animals, since as a physiologist he cannot explain it, he refuses to admit it,—'... the physiologist does not accept the great development of articulate speech in man as something qualitatively new; ...' (p. 478) —and suggests helplessly that some day we may find some new 'building stone,' an 'additional lipoid, phosphatid, or potassium ion,' in the human brain which will explain it, and concludes by saying that the difference between the mind of man and that of non-man is 'probably only one of degree,' (*op cit.*, pp. 478-79).

[4] 'Do you bite your thumb at us, sir?'—*Romeo and Juliet*, Act I, Sc. 1.

[5] 'Now since sounds have no natural connection with our ideas, but have all their signification from the arbitrary imposition of men ...,' John Locke, *Essay Concerning the Human Understanding*, Bk. III, ch. 9.

'When *I* use ... [a] word, it means just what I choose it to mean,' said Humpty Dumpty to Alice (*Through the Looking Glass*).

All symbols must have a physical form otherwise they could not enter our experience.[6] But the meaning of a symbol cannot be perceived by the senses. One cannot tell by looking at an *x* in an algebraic equation what it stands for; one cannot ascertain with the ears alone the symbolic value of the phonetic compound *si;* one cannot tell merely by weighing a pig how much gold he will exchange for; one cannot tell from the wave length of a color whether it stands for courage or cowardice, 'stop' or 'go'; nor can one discover the spirit in a fetish by any amount of physical or chemical examination. The meaning of a symbol can be communicated only by symbolic means, usually by articulate speech.

But a thing which in one context is a symbol is, in another context, not a symbol but a sign. Thus, a word is a symbol only when one is concerned with the distinction between its meaning and its physical form. This distinction *must* be made when one bestows value upon a sound-combination or when a previously bestowed value is discovered for the first time; it *may* be made at other times for certain purposes. But after value has been bestowed upon, or discovered in, a word, its meaning becomes identified, in use, with its physical form. The word then functions as a sign,[7] rather than as a symbol. Its meaning is then perceived with the senses. This fact that a thing may be both symbol (in one context) and non-symbol (in another context) has led to some confusion and misunderstanding.

Thus Darwin says: 'That which distinguishes man from the lower animals is not the understanding of articulate sounds, for as everyone knows, dogs understand many words and sentences,' (Ch. III, *The Descent of Man*).

It is perfectly true, of course, that dogs, apes,[8] horses, birds, and perhaps creatures even lower in the evolutionary scale, can be taught to respond in a specific way to a vocal command. But it does not follow that no difference exists between the meaning of 'words and sentences' to a man and to a dog. Words are both signs and symbols to man; they are merely signs to a dog. Let us analyze the situation of vocal stimulus and response.

A dog may be taught to roll over at the command 'Roll over!' A man may be taught to stop at the command 'Halt!' The fact that a dog can be taught to roll over in Chinese, or that he can be taught to 'go fetch' at the command 'roll over' (and, of course, the same is true for a man) shows that there is no necessary and invariable relationship between a particular sound combination and a specific reaction to it. The dog or the man can be taught to respond in a certain manner to *any* arbitrarily selected combination of sounds, for example, a group of nonsense syllables, coined for the occasion. On the other hand, any one of a great number

[6] This statement is valid regardless of our theory of experiencing. Even the exponents of 'Extra-Sensory Perception,' who have challenged Locke's dictum that 'the knowledge of the existence of any other thing [besides ourselves and God] we can have only by sensation,' (Bk. 4, ch. 11, *Essay Concerning the Human Understanding,*) have been obliged to work with physical rather than ethereal forms.

[7] A *sign* is a physical form whose function is to indicate some other thing—object, quality, or event. The meaning of a sign may be intrinsic, inseparable from its physical form and nature, as in the case of the height of a column of mercury as an indication of temperature; or, it may be merely identified with its physical form, as in the case of a hurricane signal displayed by a weather bureau. But in either case, the meaning of the sign is perceived with the senses.

[8] 'Surprising as it may seem, it was very clear during the first few months that the ape was considerably superior to the child in responding to human words,' W. N. and L. A. Kellogg, *The Ape and the Child,* (New York, 1933).

and variety of responses may become evocable by a given stimulus. Thus, so far as the *origin* of the relationship between vocal stimulus and response is concerned, the nature of the relationship, i.e., the meaning of the stimulus, is not determined by properties intrinsic in the stimulus.

But, once the relationship has been established between vocal stimulus and response, the meaning of the stimulus becomes *identified with the sounds;* it is then *as if* the meaning were intrinsic in the sounds themselves. Thus, 'halt' does not have the same meaning as 'hilt' or 'malt.' A dog may be conditioned to respond in a certain way to a sound of a given wave length. Sufficiently alter the pitch of the sound and the response will cease to be forthcoming. The meaning of the stimulus has become identified with its physical form; its value is perceived with the senses.

Thus we see that in establishing a relationship between a stimulus and a response the properties intrinsic in the stimulus do not determine the nature of the response. But, *after the relationship has been established* the meaning of the stimulus is *as if* it were *inherent* in its physical form. It does not make any difference what phonetic combination we select to evoke the response of terminating self-locomotion. We may teach a dog, horse, or man to stop at any vocal command we care to choose or devise. But once the relationship has been established between sound and response, the meaning of the stimulus becomes identified with its physical form and is, therefore, perceivable with the senses.

So far we have discovered no difference between the dog and the man; they appear to be exactly alike. And so they are as far as we have gone. But we have not told the whole story yet. No difference between dog and man is discoverable so far as learning to respond appropriately to a vocal stimulus is concerned. But we must not let an impressive similarity conceal an important difference. A porpoise is not yet a fish.

The man differs from the dog—and all other creatures—in that *he can and does play an active role in determining what value the vocal stimulus is to have, and the dog cannot.* As John Locke has aptly put it, 'All sounds [i.e., in language] . . . have their signification from the arbitrary imposition of men.' The dog does not and cannot play an active part in determining the value of the vocal stimulus. Whether he is to roll over or go fetch at a given stimulus, or whether the stimulus for roll over be one combination of sounds or another is a matter in which the dog has nothing whatever to 'say.' He plays a purely passive role and can do nothing else. He learns the meaning of a vocal command just as his salivary glands may learn to respond to the sound of a bell. But man plays an active role and thus becomes a creator: Let x equal three pounds of coal and it does equal three pounds of coal; let removal of the hat in a house of worship indicate respect and it becomes so. This creative faculty, that of freely, actively, and arbitrarily bestowing value upon things, is one of the most commonplace as well as *the* most important characteristic of man. Children employ it freely in their play: 'Let's pretend that this rock is a wolf.'

The difference between the behavior of man and other animals then, is that the lower animals may receive new values, may acquire new meanings, but they cannot create and bestow them. Only man can do this. To use a crude analogy, lower animals are like a person who has only the receiving apparatus for wireless messages: He can receive messages but cannot

send them. Man can do both. And this difference is one of kind, not of degree: a creature can either 'arbitrarily impose signification,' to use Locke's phrase, can either create and bestow values, or he cannot. There are no intermediate stages.[9] This difference may appear slight, but, as a carpenter once told William James in discussing differences between men, 'it's very important.' All *human* existence depends upon it and it alone.

The confusion regarding the nature of words and their significance to men and the lower animals is not hard to understand. It arises, first of all, from a failure to distinguish between the two quite different contexts in which words function. The statements, 'The meaning of a word[10] cannot be perceived with the senses,' and 'The meaning of a word can be perceived with the senses,' though contradictory, are nevertheless equally true. In the *symbol* context the meaning cannot be perceived with the senses; in the *sign* context it can. This is confusing enough. But the situation has been made worse by using the words 'symbol' and 'sign' to label, not the *different contexts,* but *one and the same thing:* the word. Thus a word is a symbol *and* a sign, two different things. It is like saying that a vase is a *doli* and a *kana*—two different things—because it may function in two contexts, esthetic and commercial.[11]

That which is a *symbol* in the context of origination becomes a *sign* in use thereafter. Things may be either signs or symbols to man; they can be only signs to other creatures.

IV

Very little indeed is known of the organic basis of the symbolic faculty: we know next to nothing of the neurology of symbolizing.[12] And very few scientists —anatomists, neurologists, physical anthropologists—appear to be interested in the problem. Some, in fact, seem to be unaware of the existence of such a problem. The duty and task of giving an account of the organic basis of symbolizing does not fall within the province of the sociologist or the cultural anthropologist. On the contrary, he should scrupulously exclude it as irrelevant to his problems and interests; to introduce it would bring only confusion. It is enough for the sociologist or cultural anthropologist to take the ability to use symbols, possessed by man alone, as given. The use to which he puts this fact is in no way affected by his, or even the anatomist's, inability to describe the symbolic process in neurological terms. However, it is well for the social scientist to be acquainted with the little that neurologists and anatomists do know about the structural basis of 'symboling.' We, therefore, review briefly the chief relevant facts here.

The anatomist has not been able to discover why men can use symbols and apes cannot. So far as is known the only difference between the brain of man and the brain of an ape is a quantitative one: '. . . man has no new kinds of brain cells

[9] Professor Linton speaks of 'the faintest foreshadowings of language . . . at the animal level,' (*op cit.,* p. 74). But precisely what these 'faintest foreshadowings' are he does not say.

[10] What we have to say here would, of course, apply equally well to gestures (e.g., the 'sign of the cross,' a salute), a color, a material object, etc.

[11] Like a word, the value of a vase may be perceived by the senses or imperceptible to them depending upon the context in which it is regarded. In an esthetic context its value is perceived with the senses. In the commercial context this is impossible; we must be *told* its value—in terms of price.

[12] Cf. 'A Neurologist Makes Up His Mind,' by C. Judson Herrick, *Scientific Monthly,* August, 1939. Professor Herrick is a distinguished one of a not too large number of scientists who are interested in the structural basis of symbol using.

or brain cell connections,' (A. J. Carlson, *op. cit.*). Nor does man, as distinguished from other animals, possess a specialized 'symbol-mechanism.' The so-called speech areas of the brain should not be identified with symbolizing. These areas are associated with the muscles of the tongue, larynx, etc. But symbolizing is not dependent upon these organs. One may symbolize with the fingers, the feet, or with any part of the body that can be moved at will.[13]

To be sure, the symbolic faculty was brought into existence by the natural processes of organic evolution. And we may reasonably believe that the focal point, if not the locus, of this faculty is in the brain, especially the forebrain. Man's brain is much larger than that of an ape, both absolutely and relatively.[14] And the forebrain especially is large in man as compared with ape. Now in many situations we know that quantitative changes give rise to qualitative differences. Water is transformed into steam by additional quanties of heat. Additional power and speed lift the taxi-ing airplane from the ground and transform terrestrial locomotion into flight. The difference between wood alcohol and grain alcohol is a qualitative expression of a quantitative difference in the proportions of carbon and hydrogen. Thus a marked growth in size of the brain in man may have brought forth a *new kind* of function.

V

All culture (civilization) depends upon the symbol. It was the exercise of the symbolic faculty that brought culture into existence and it is the use of symbols that makes the perpetuation of culture possible. Without the symbol there would be no culture, and man would be merely an animal, not a human being.

[13] The misconception that speech is dependent upon the so-called (but mis-called) organs of speech, and, furthermore, that man alone has organs suitable for speech, is not uncommon even today. Thus Professor L. L. Bernard lists 'The fourth great organic asset of man is his vocal apparatus, also characteristic of him alone,' (*Introduction to Sociology*, J. Davis and H. E. Barnes, eds., p. 399; New York, 1927).

The great apes have the mechanism necessary for the production of articulate sounds: 'It seemingly is well established that the motor mechanism of voice in this ape [chimpanzee] is adequate not only to the production of a considerable variety of sounds, but also to definite articulations similar to those of man,' R. M. and A. W. Yerkes, *The Great Apes*, p. 301 (New Haven, 1929). Also: 'All of the anthropoid apes are vocally and muscularly equipped so that they could have an articular language if they possessed the requisite intelligence,' E. A. Hooton, *Up From the Ape*, p. 167 (New York, 1931).

Furthermore, the mere production of articulate sounds would not be symbolizing any more than the mere 'understanding of words and sentences' (Darwin) is. John Locke made this clear two and a half centuries ago: 'Man, therefore had by nature his organs so fashioned, as to be *fit to frame articulate sounds*, which we call words. But this was not enough to produce language; for parrots, and several other birds, will be taught to make articulate sounds distinct enough, which yet, by no means, are capable of language. Besides articulate sounds, therefore, it was further necessary, that he should be *able to use these sounds as signs of internal conceptions;* and to make them stand as marks for the ideas within his own mind, whereby they might be made known to others . . . ,' Book III, Ch. 1, Secs. 2, 3, *Essay Concerning the Human Understanding*.

And J. F. Blumenbach, a century later, declared in his *On the Natural Variety of Mankind*, 'That speech is the work of reason alone, appears from this, that other animals, although they have nearly the same organs of voice as man, are entirely destitute of it,' (quoted by R. M. and A. W. Yerkes, *op. cit.*, p. 23).

[14] Man's brain is about two and one-half times as large as that of a gorilla. 'The human brain is about 1/50 of the entire body weight, while that of a gorilla varies from 1/150 to 1/200 part of that weight,' (Hooton, *op. cit.*, p. 153).

Articulate speech is the most important form of symbolic expression. Remove speech from culture and what would remain? Let us see.

Without articulate speech we would have no *human* social organization. Families we might have, but this form of organization is not peculiar to man; it is not *per se, human*. But we would have no prohibitions of incest, no rules prescribing exogamy and endogamy, polygamy or monogamy. How could marriage with a cross cousin be prescribed, marriage with a parallel cousin proscribed, without articulate speech? How could rules which prohibit plural mates possessed simultaneously but permit them if possessed one at a time, exist without speech?

Without speech we would have no political, economic, ecclesiastic, or military organization; no codes of etiquette or ethics; no laws; no science, theology, or literature; no games or music, except on an ape level. Rituals and ceremonial paraphernalia would be meaningless without articulate speech. Indeed, without articulate speech we would be all but toolless: we would have only the occasional and insignificant use of the tool such as we find today among the higher apes, for it was articulate speech that transformed the nonprogressive tool-using of the ape into the progressive, cumulative tool-using of man, the human being.

In short, without symbolic communication in some form, we would have no culture. 'In the Word was the beginning' of culture—and its perpetuation also.[15]

[15] 'On the whole, however, it would seem that language and culture rest, in a way which is not fully understood, on the same set of faculties . . .,' A. L. Kroeber, *Anthropology*, p. 108, (New York, 1923).

It is hoped that this essay will make this matter more 'fully understood.'

To be sure, with all his culture man is still an animal and strives for the same ends that all other living creatures strive for: the preservation of the individual and the perpetuation of the race. In concrete terms these ends are food, shelter from the elements, defense from enemies, health, and offspring. The fact that man strives for these ends just as all other animals do has, no doubt, led many to declare that there is 'no fundamental difference between the behavior of man and of other creatures.' But man does differ, not in *ends* but in *means*. Man's means are cultural means: culture is simply the human animal's way of living. And, since these means, culture, are dependent upon a faculty possessed by man alone, the ability to use symbols, the difference between the behavior of man and of all other creatures is not merely great, but basic and fundamental.

VI

The behavior of man is of two distinct kinds: symbolic and nonsymbolic. Man yawns, stretches, coughs, scratches himself, cries out in pain, shrinks with fear, 'bristles' with anger, and so on. Nonsymbolic behavior of this sort is not peculiar to man; he shares it not only with other primates but with many other animal species as well. But man communicates with his fellows with articulate speech, uses amulets, confesses sins, makes laws, observes codes of etiquette, explains his dreams, classifies his relatives in designated categories, and so on. This kind of behavior is unique; only man is capable of it; it is peculiar to man because it consists of, or is dependent upon, the use of symbols. The nonsymbolic behavior of man is the behavior of man the animal; the symbolic behavior is that of man

the human being.[16] It is the symbol which has transformed man from a mere animal to a human animal.

As it was the symbol that made mankind human, so it is with each member of the race. A baby is not a human being so far as his behavior is concerned. Until the infant acquires speech there is nothing to distinguish his behavior qualitatively from that of a young ape.[17] The baby becomes a human being when and as he learns to use symbols. Only by means of speech can the baby enter and take part in the human affairs of mankind. The questions we asked previously may be repeated now. How is the growing child to know of such things as families, etiquette, morals, law, science, philosophy, religion, commerce, and so on, without speech? The rare cases of children who grew up without symbols because of deafness and blindness, such as those of Laura Bridgman, Helen Keller and Marie Heurtin, are instructive.[18] Until they 'got the idea' of symbolic communication they were not human beings, but animals, they did not participate in behavior which is peculiar to human beings. They were 'in' human society as dogs are, but they were not *of* human society. And, although the present writer is exceedingly skeptical of the reports of the so-called 'wolf-children,' 'feral men,' etc., we may note that they are described, almost without exception, as without speech, 'beastly,' and 'inhuman.'

VII

Summary. The natural processes of organic evolution brought into existence in man, and man alone, a new and distinctive ability: the ability to use symbols. The most important form of symbolic expression is articulate speech. Articulate speech means communication of ideas; communication means preservation—tradition—and preservation means accumulation and progress. The emergence of the organic faculty of symbol-using has resulted in the genesis of a new order of phenomena: a superorganic, or cultural, order. All civilizations are born of, and are perpetuated by, the use of symbols. A culture, or civilization, is but a particular kind of form (symbolic) which the biologic, life-perpetuating activities of a particular animal, man, assume.

Human behavior is symbolic behavior; if it is not symbolic, it is not human.

[16] It is for this reason that observations and experiments with apes, rats, etc., can tell us nothing about human behavior. They can tell us how ape-like or rat-like man is, but they throw no light upon human behavior because the behavior of apes, rats, etc., is nonsymbolic.

The title of the late George A. Dorsey's best seller, ***Why We Behave Like Human Beings,*** was misleading for the same reason. This interesting book told us much about vertebrate, mammalian, primate, and even man-animal behavior, but virtually nothing about symbolic, i.e., human, behavior. But we are glad to add, in justice to Dorsey, that his chapter on the function of speech in culture, (Ch. II) in ***Man's Own Show: Civilization*** (New York, 1931), is probably the best discussion of this subject that we know of in anthropological literature.

[17] In their fascinating account of their experiment with a baby chimpanzee, kept for nine months in their home and treated as their infant son was treated, Professor and Mrs. Kellogg speak of the 'humanization' of the little ape: 'She may thus be said to have become "more humanized" than the human subject . . .' (p. 315).

This is misleading. What the experiment showed so strikingly was ***how like an ape*** a child of homo sapiens is ***before he learns to talk.*** The boy even employed the ape's 'food bark'! The experiment also demonstrated the ape's utter inability to learn to talk, which means an inability to become humanized at all.

[18] The reader will find a resume of the more significant facts of these cases in W. I. Thomas, ***Primitive Behavior,*** pp. 50-54, 776-777 (New York, 1937).

The infant of the genus homo becomes a human being only as he is introduced into and participates in that supraorganic order of phenomena which is culture. And the key to this world and the means of participation in it is—the symbol.

As much as animal and human inheritance have in common, there is, however, one respect in which they are vastly different. In the strict biological, and perhaps most fundamental, sense inheritance implies that the determining units, the genes, of one individual live and flourish in the cells of another; that, in a real sense, the one continues to live, in part, in the other. But in the domain of the intellect inheritance is not limited to such cumbrous methods of transmission. After the evolution of the power of speech minds spoke to other minds directly and effectively, independently of genetic relationship, with resulting acceleration of the evolution of the cerebral cortex. With the later invention of writing those who dwelt afar could send their words across the intervening spaces, and those who were dead could still speak to the living.

In a real sense we are direct intellectual descendants of all whose words have influenced our minds. The writing of Moses and David and Solomon are precious parts of our heritage, as in other fields are those of Greek scientists and philosophers. From the Jews we have inherited theology; from the Egyptians, geometry; from the Persians, astronomy; from the Babylonians, mythology; from myriads of others, the wisdom that has been distilled out of the dross of the lives of a thousand generations. Shakespeare to the contrary notwithstanding, the good that men do lives after them and the evil is generally interred with their bones, for the enduring heroes of the race are not its imbeciles or criminals or greedy or rich or powerful or even conquerors. Instead, those who live most abundantly in the lives of their successors are the wise, the good, the generous, the morally great. For this reason alone the prospects for the future of humanity are favorable.

F. R. MOULTON, *A.A.A.S. Bulletin*, January, 1944

THE ETHICS OF TIME-BINDING (!)

'A firm believer in the Golden Rule, [Eugene] Grace [Bethlehem Steel Company] feels that the best thing one can offer one's fellow man is a chance to get the best of everyone else, since this is all he has ever wanted for himself.'

Life, January 26, 1942

A. B. JOHNSON AND HIS WORKS ON LANGUAGE[1]

STILLMAN DRAKE *

I

AT the Utica Lyceum in 1825, Mr. Alexander Bryan Johnson, a locally prominent banker, expounded to his fellow townsmen some novel views on the nature of language. 'My lectures,' he said, 'will endeavour to subordinate language to nature; to make nature the expositor of words, instead of making words the expositors of nature. If I succeed, the success will ultimately accomplish a great revolution in every branch of learning. . . . That language will eventually receive the interpretation for which I contend, I cannot doubt; but that I possess the ability to make existing errours perceived even, I much question.' (2)[1]

His lectures were published three years later under the title, *The Philosophy of Human Knowledge, or A Treatise on Language*. This work 'excited no attention except many gratifying letters . . . from strangers in various states of our Union, and one extensive review. (2) Nevertheless, he received so many requests for copies after the first edition had been exhausted that he revised the work and republished it in 1836 under the less pretentious title of *A Treatise on Language, or The Relation which Words Bear to Things*. The intervening years had apparently strengthened his doubts in his own ability to accomplish the revolution he had predicted, for in the preface to this second edition he says:

'. . . all that the book contains is the elucidation of but one precept; namely, to interpret language by nature. . . . The precept itself which I have sought to illustrate, I profoundly respect; but whether I have demonstrated its importance, the publick must determine. Amid active and extensive employments, and with no external stimulus to literary pursuits, I shall be satisfied if the succeeding discourses shall commend the doctrine to the efforts of men whose understandings are more comprehensive than mine, and whose labours the world is accustomed to respect.'

Even this modest hope was never realized. The two authors among his contemporaries in whose work I have been able

* Regional Statistician for the War Production Board in San Francisco. Graduated in 1932 from the University of California in the department of philosophy, Mr. Drake did his postgraduate work at the same institution in mathematics.

[1] Following are the principal works; quotations from each are identified by the corresponding number.

(1) *The Philosophy of Human Knowledge, or a Treatise on Language.* New York, 1828.

(2) *A Treatise on Language, or The Relation which Words Bear to Things.* New York, 1836.

(3) *The Meaning of Words: Analysed into Words and Unverbal Things.* New York, 1854.

(4) *The Physiology of the Senses; or, How and What we See, Hear, Taste, Feel, and Smell.* New York and Cincinnati, 1856.

to find mention of Johnson's views did nothing to further them. The first, an English surgeon named Edward Johnson,[2] prefaced his *Nuces Philosophae* (London, 1842) with an extensive quotation from the *Treatise*, but devoted the book to a defense and extension of Horne Tooke's thesis that etymology affords the true key to the meaning of language. The second author was one whose labors were certainly widely respected, but not one who was likely to devote them to the program outlined by Johnson. It was Dr. Horace Bushnell, who said, in the introductory dissertation on language included in his *God in Christ* (Hartford, 1849):

'There are no words, in the physical department of language, that are exact representatives of particular physical things. For whether we take the theory of the Nominalists or the Realists, words are, in fact, and practically, names only of genera, not of individuals or species. To be even more exact, they represent only certain sensations of sight, touch, taste, smell, hearing—one or all. Hence the opportunity in language for endless mistakes and false reasonings, in reference to matters purely physical. This subject was labored some years ago with much acuteness and industry by one of our countrymen, Mr. A. B. Johnson, in a "Treatise on Language, or the Relation of Words to Things." The latter part of his title, however, is all that is justified; for to language in its more comprehensive sense, as a vehicle of spirit, thought, sentiment, he appears to have scarcely directed his inquiries.'

The next reference to Johnson's views on language (so far as I can find) was made nearly one hundred years later, in Irving Lee's *Language Habits in Human Affairs* (New York, 1941). Meanwhile, the revolution that Johnson forecast appears to have begun in at least some branches of learning, without the slightest influence being traceable to him. The similarity of his works to those of the semanticists, although astonishingly close, seems to have escaped comment—perhaps because of the scarcity of Johnson's books after a century of neglect.[3] The selection of quotations from them for this article was guided by a desire to enable the reader to make the comparison.

[2] Whether or not he was a relative of A. B. Johnson, I am unable to determine.

II

A few words about the man himself may be in order first. A. B. Johnson was born in Gosport, England, in 1786. He remained there until the completion of his formal education, in 1801. His father having proceeded to America some years previously, the son joined him and went to work in his general store at Utica, New York.

After a few years of this work, Johnson established a glass factory at Geneva. This he soon sold, going to New York City, where he became familiar with banking. Returning to Utica at the outbreak of the War of 1812, he participated in the organization there of a branch bank. Soon afterward he contrived to get through the State Legislature a charter for an insurance company, which implied banking powers—a device also used by Aaron Burr. Under this charter he operated his own bank until 1818, when the courts and legislature intervened. Johnson studied law, and was admitted to the bar, but never practiced. Until 1852 he was president of an important bank in Utica; in that year he resigned and made a tour of Europe, as the result of a 'severe domestic affliction.' The source of these

[3] Copies of the books are practically unobtainable. Of the four quoted here, the Library of Congress has all but the last. There is a complete set of Johnson's works at the Utica Public Library.

biographical remarks, M. M. Bagg's *Pioneers of Utica,* does not go into details. Johnson himself speaks of his life as being 'marked with sorrows of no ordinary magnitude.' (3)

When he returned from Europe, Johnson organized a bank of his own. This was an unfortunate venture, for the bank collapsed inside of eighteen months, apparently as a result of important information being withheld from him. Although clearly not to blame for the disaster, he worked unremittingly to save what he could from the wreck, and succeeded in paying all creditors in full. He died in 1867.

Bagg says that Johnson had the reputation of being intensely scrupulous, but harsh and severe, and of being interested only in money-making. He himself contended that he followed his profession only to attain financial independence, which he desired for the purpose of being free to write. He published a number of books covering a wide range of subjects—economics, politics, religion, and language—and a quantity of periodical articles, mostly on political matters. He issued in 1830 a proposal to compile a 'Collated Dictionary, or a Complete Index of the English Language: designed to exhibit together all words which relate to the same subject, for the benefit of persons who are not acquainted with the whole compass of the language, and to assist the memory of persons who are acquainted.' He worked for several years on this project, but never completed it. Roget's *Thesaurus* appeared in London in 1852, fulfilling the stated object.

In the arrangement of material below, I have followed the order used by Johnson in developing his subject in the original lectures. Each quotation is given in its earliest form, except where a subsequent alteration seems clearer, or a later example more apt. Italics have been used where another author is quoted by Johnson.

One more prefatory remark: In attempting an analysis of language, it should not matter where one begins, or in what direction one strikes out, since the whole ground must eventually be covered, and a foothold is difficult to obtain anywhere. But an author must start somewhere, and each has certain predilections which induce him to choose one starting point as essentially the simplest or most fundamental. This is likely to have the effect of emphasizing excessively one phase of his analysis, and detracting from others of equal importance. In each of Johnson's books on language, the analysis is begun by pointing out the individuality of the data received through each of the senses. The reader is cautioned that in doing this, Johnson's concern was with language, and not with epistemology; this warning appears frequently in each of his books. So also does the disavowal of any intention to subvert any philosophical or theological system, or to refute any scientific position. 'Many of the scientific tenets on which I comment are probably no longer authoritative, and kindred errors may be numerous; but if the reader shall collect from my comments the views of language that I entertain, he will collect all that I seek to accomplish, and I plead guilty in advance of all the scientific errors of which he may be able to convict me.' (3)

III

The opening lecture begins with a definition of terms:

'To avoid an ambiguity which is inherent in language, I will apply the term sights, to all the information that we derive from seeing; the term sounds, to all the information of hearing; and the terms feels, tastes, and smells, to all the information of the other senses. Hence, instead

of saying that an orange is one existence, endued with several qualities, I shall estimate it as several existences, associated under one name, orange. Its appearance, I shall denominate the sight orange; its flavour, the taste orange; its odour, the smell orange; and its consistence, the feel orange. I shall adopt this phraseology not to build thereon a theory, but to discriminate between the information of different senses.' (1)

'To investigate the sights, sounds, feels, tastes, and smells, which separately, and in various associations, constitute the external universe, is not my present object; nor shall I discuss whether sights, sounds, tastes, feels, and smells, are words which appropriately designate external existences. I adopt the phraseology as a means of investigating the nature of language; and if I shall establish the utility of the adoption, I trust you will tolerate the expressions, how much soever they may offend against euphony and custom.' (2)

Johnson then sets forth his first general observation on language; namely, that the identity of an object as implied by language may or may not correspond to an identity in nature, and most frequently does not.

'The simple property which permits a word to name phenomena of different senses, has enabled theorists to convert the realities of life into a fairy tale. A universally admitted speculation of this character is, that distance, magnitude, figure, and extension, are not visible. This was originally suggested by Bishop Berkeley. He perceived that there are in roundness two phenomena—a sight and a feel; while there is but one name—roundness. The unity which exists in the name he attributed to nature; hence, he decided that the feel is the true roundness, and that sight possesses only an imaginary significance. . . . . Berkeley never imagined that invisibility was predicable of roundness by means of a latent ambiguity in language; but he accused vision with the production of a delusion.' (1)

'*When I look at a book,* says Professor Reid, *it seems to possess thickness, as well as length and breadth; but we are certain that the visible appearance has no thickness, for it can be represented exactly on a flat piece of canvas.*

'I am as certain as Mr. Reid that paintings possess not the feel thickness; still, this is no contradiction of what I see. The picture proves only that the sight thickness and the feel are not always associated. . . . From the frequency with which the sight and the feel are associated, we have given them but one name, and suppose them identical; but pictures would always have taught us the contrary, if we had not preferred the construction of a paradox.' (1)

'If you place a grain of musk in a phial, and hermetically seal the phial, you will soon smell the musk notwithstanding its confinement. The intellect conceives an analogy between the passage of the odour through the glass, and the passage of water through a sieve; hence we apply the word passage to both cases, though the passage of the odour is a smell and the passage of water is a sight and a feel. The intellect of a child will see an analogy between the two passages, and will therefore understand when you tell him that the odour passes through the phial, and he will become surprised thereat only when you stultify him by the belief that the passage of water and the passage of the odour are not merely analogous intellectually, but physically identical. A better use of the experiment is to eluci-

date therewith the nature of language, and for that purpose I adduce it.' (4)[4]

The almost irresistible tendency to impute to nature the identities that exist in language is illustrated by a wealth of examples. Johnson asserts that many metaphysical positions owe their lives to this confusion.

IV

His next principle is stated in these words: 'Every word is a sound, which had no signification before it was employed to name some phenomenon, and which even now has no signification apart from the phenomena to which it is applied.' (1)

'This principle, when thus expressed, seems obvious; still, in practice, it has escaped the vigilance of the most acute, and supplied metaphysicks with its most perplexing doctrines.

'Thus, take the word weight—it names a feel. The feel is abundantly familiar. It is discoverable in a feather, in a piece of lead, and in nearly every object. The word possessed no significancy before its introduction into language, and it now possesses none apart from the feel that it designates.

'Admit then that weight is the name of a feel, and observe how speciously I can employ the word after I divest it of all signification: thus, many objects are too small to be seen with the unassisted eye; and some the most powerful microscope can render but just visible; we may therefore well believe that numerous atoms are so small that no microscope can reveal them: still each must possess . . . . weight.

'Now observe, if weight names a feel, how has the word any signification when we predicate it of an atom, in which confessedly the feel cannot be experienced? What feel is that which cannot be felt? We have subtracted from the word all its significancy, and left nothing but a vacated sound. It becomes weight minus weight.' (1)

'Because a cubick inch of air weighs the third part of a grain, we calculate the number of cubick inches of air which rest on a man in a column of forty or fifty miles in altitude; and by calling every inch the third part of a grain, we conclude that every man supports fourteen tons of air. Is not this divesting the phrase fourteen tons of its significance? Weight (and especially fourteen tons) is the name of a feel; and to use the word where no feel is discoverable, is like talking of a toothache which cannot be felt, or of an inaudible melody.' (2)

V

The third property of language to which Johnson turns his attention is the variety of applications which each word possesses in actual use: 'Snow is white, paper is white, silver is white, the air is white, glass is white, you are white, and the floor is white; hence, after you are satisfied of the propriety of calling an object white, I shall know but little of its appearance, without I take an actual view of the object.' (2)

'Though we suppose generally that external objects cause in other persons similar sights, tastes, feels, sounds, and smells, to those which they produce in us; yet, say metaphysicians, *no man can possibly know this with certainty.*

'Apparently there is a mysterious contradiction in the above metaphysical assertion; for while we wonder at the alleged impossibility, we are confident of its practical inefficiency. But the difficulty proceeds from not knowing that the word *similar* has several meanings, and that it

[4] *The Westminster Review* for October 1856, reviewing *The Physiology of the Senses*, described it as 'distinguished by an agreeable raciness of style.'

is used diversely in the above positions. When I say, that the heat which I am feeling is similar to what I felt yesterday, the word *similar* refers to the antecedent feel and the present. So long as I restrict thus its meaning, I cannot know that fire produces in you a *similar* feeling to what it produces in me. I cannot feel with your organs.

'But we intend a different meaning when we affirm that the feel which you experience is *similar* to mine. The word similar means now that you display, under the operation of heat, appearances like those which I exhibit, or that you describe your feelings in the same language, &c. . . . The assertions refer to different phenomena.' (1)

'An ignorance of the principle which we are now considering occasions also much admiration; thus Professor Stewart, in his Philosophy, says, *an expert accountant can enumerate, almost at a glance, a long column, though he may be unable to recollect any of the figures which compose the sum.*

'Thus far the statement . . . creates no perplexity, but when he adds, *nobody doubts but each of these figures has passed through the accountant's mind,* the case seems altered. The accountant begins to wonder that he does not recollect the several figures. Passing through the mind, he supposes to mean something different from what he experiences in addition. He does not know that words mean, in every case, the phenomena to which they refer. He supposes rather that the passage of the figures through the mind signifies the same as the passage of an army through the gate of a city.' (1)

'Our natural bias is to conceive white, blue, and yellow, which exist in the mind only, as something spread over the surface of bodies. (Stewart)

'A painter might startle if he should be informed that white, blue, and yellow are not spread over the surface of bodies. Has he suffered a delusion which you are about to dispel? No; you are using the phrase "spread over the surface" as no man ever used it when applied to colours. You insist that the phrase has but one signification, and because that signification is undiscoverable in colours, you conclude that mankind are suffering an egregious errour. The errour is, however, in language, which has not a peculiar term to express every phenomenon, but employs the same term to name several phenomena. You transfer a defect which exists in language, to our senses, where it exists not.

'What is the spreading over the surface to which Mr. Stewart refers? He will admit that baize can be spread over the surface of a table—this affords an elucidation of his meaning. It "is" where we can feel the body that is covered and the body that covers. All, then, which Mr. Stewart means is, that colour cannot be felt—a sight cannot be felt. . . . Mr. Stewart will admit that the oil and lead which compose colour can be spread over the surface of bodies. It is the sight colour which produces the difficulty. The sight can never be spread over the surface of a body, so long as we confine the signification of the phrase to the phenomena of feeling.' (1)

VI

Scientists as well as philosophers are reproached for the deliberate choice of phrases designed to excite astonishment and admiration. 'After a moment's exposure a drop of the otto of roses will fill with odour many rooms, while the drop will exhibit no diminution of size. This phenomenon is too common to excite admiration, but much may be excited if you

exhibit the experiment to teach a person the expansiveness of matter. He will now snuff the odour with astonishment. Bless me! how wonderfully a little matter may be expanded! A dozen rooms are full of it! The person is evidently interpreting the smell by the phrase "expansiveness of matter." He knows not that the phrase should be interpreted by the smell.' (2)

'But if he is astonished at the preceding, what will he say of the particles of light? *They fall,* says Natural Philosophy, *millions of miles, and with a velocity so wonderful as to accomplish the descent in an instant; still they do not hurt even the eye, though they alight immediately on that susceptible organ.* Many a man grown old under the rays of the sun is astonished at this recital. The astonishment does not proceed from the phenomena, but from the language. Minuteness, he supposes, is the only difference between a particle of light and a particle of stone. That he cannot feel the particles of light he attributes to the grossness of his senses, and not to the non-existence of a tangible object: hence, if he is informed farther that philosophers have in vain endeavoured with the nicest balances, to discover weight in sunbeams, even when the number of particles thrown into a scale has been multiplied by a powerful lens, the experiment increases his wonder at the smallness of the particles; though it ought to teach him that the mystery is nothing but a latent sophistry of language. The word particle, when applied to light, means only the phenomenon to which it is applied. It names a sight. To wonder that the eye cannot feel the particles of light is to wonder that they cannot feel a sight. We may as well wonder that we cannot taste sounds and hear smells.' (1)

'*That light, itself a body, should,* says Mr. Brown, *pass freely through solid crystal, is regarded by us as a physical wonder.* Why? . . . No man was ever surprised at finding light enter his room when he threw open his window shutters. The wonder is produced by our interpretation of the words in which this common phenomenon is expressed. When we suppose that the passage of light through crystal is the same as the passage of my hand through crystal, we are necessarily astonished; but when we find that the phrase means only what crystal is continually exhibiting, our surprise vanishes with the delusion that created it.

'It is instructive to observe how insidiously language enables us to infer that light ought to encounter opposition in its passage through crystal. If Mr. Brown had merely stated that light passes through crystal, there would have appeared no reason why it should not pass through. But the addition of one word seems to show that there is, in the passage of light, a wonder which, if not so miraculous as the passage of Moses through the Red Sea, is more inconceivable: I allude to the word body. . . . Body is generally the name of a feel; hence, when we say that light is a body, we do not consider that the signification of the word body is governed by the phenomena to which it is applied. We suppose rather that the name regulates the character of the phenomenon, and that to apply the term body to light, determines that light is a feel: and hence the wonder that light should pass through crystal. The wonder is not that the sight which we witness should occur, but that something else should happen—a something which is purely a delusion of language.' (1)

VII

Having established to his satisfaction that every word has as many meanings as it has different applications (that the meaning of a word is the phenomenon to

which it refers in any given case), Johnson proceeds with a similar analysis of general propositions. 'Every general proposition has as many significations as it possesses different particulars to which it refers.' (1)

'To say that the earth is a sphere, that it revolves round the sun, and round its own axis; that the moon influences the tides, and that there are antipodes, are truths so long as we consider the expressions significant of certain phenomena to which the propositions refer. If you inquire of an astronomer whether the earth is a sphere, he will immediately refer you to various phenomena. He will desire you to notice what he terms the earth's shadow in an eclipse of the moon, the gradual disappearance of the hull of a ship as it recedes from the shore, &c. After hearing all that he can adduce in proof of the earth's sphericity, consider his proposition significant of these phenomena. If you deem it significant beyond them, you are deceived by the forms of language.' (1)

'I heard a man contend that no degree of heat could melt diamonds; whilst another was positive that they would melt. I discovered that he who asserted their fusibility, referred to nothing but an article which he had read in a Cyclopedia; and he who maintained their infusibility, referred to an assertion of his father. Both persons were positive, because they intended no more than the above facts. If, however, each had discovered the other's meaning, the controversy would probably not have terminated. It would unconsciously have changed to another question, whether the Cyclopedia was entitled to more credence than the father; the discussion of which would have produced an altercation as virulent as the former, and with as little understanding by each disputant of the facts referred to by the other.' (1)

'*The more,* says St. Pierre, *temples are multiplied in a state, the more is religion enfeebled.* What did St. Pierre mean? You will find it in his succeeding paragraph. *Look,* says he, *at Italy, covered with churches, yet Constantinople is crowded with Italian renegadoes; while the Jews, who had but one temple, are so strongly attached to their religion, that the loss of their temple excites, to this day, their regret.*

'This general proposition means but the above particulars, therefore you need not controvert the position, and show that in your country the increase of temples increases the number and zeal of worshippers. If you argue with St. Pierre, place the contest on its proper basis; blame him for using words in a way which you do not approve, but not for denying facts to which he never alluded.

'Malebranche, in accounting for the phenomena of memory, says, *in childhood the fibres of the brain are soft and flexible; but time dries and hardens them, so that in old age they are gross and inflexible.*

'Malebranche is not enumerating any phenomena discoverable by inspection of the brain. What then does he mean? It follows in his own words: *we see that flesh hardens by time, and that a young partridge is more tender than an old one.* You may wonder what this has to do with memory. I know not. It has, however, to do with his theory; and it probably constitutes all he means by the hardness and inflexibility which he makes age inflict upon the brain.' (1)

'From an ignorance of the principle which I have now endeavoured to illustrate, . . . we are prone to award unmerited commendation to the authors of general propositions: thus, the assertion attributed to Pythagoras, that the earth revolves round the sun, is supposed to imply a knowledge by him of the New-

tonian theory; while probably no feature of it was ever imagined by Pythagoras. He may have intended some particulars that have long been exploded from science.' (1)

'Speculative writers are particularly fruitful of general propositions, and usually without subjoining any objective example by way of key to the respective riddles which they thus construct . . . Politicians find such propositions a convenient mode of expressing opinions that will suit everybody; for instance, a "judicious tariff" is precisely what every man desires, though one man may mean thereby an import duty of a hundred per cent. ad valorem, and another man may mean a total exemption from any duty. . . . . "To give to every private individual the utmost personal liberty that is useful to the individual himself as well as the nation," will meet the approbation of the most liberal démocrat and the most tyrannical autocrat. . . . When we consider the character of general propositions, we see a propriety in refraining from speech if we have nothing to communicate but general propositions. . . . "Fellow citizens!" might a Fourth of July orator say . . . "The destiny of our beloved country is in our keeping; let us be faithful to our sacred trust, and support no man for any public station who will not advocate principles that will bear the scrutiny of virtue; for, without virtue, all seeming prosperity is baseless, and all seeming good but evil in disguise. . . . Finally, fellow citizens, let us not be deceived by false demagogues who speak what they mean not, but let us believe honest patriots who mean what they speak, though they tell us unpalatable truths."

'Propositions like the above assimilate to poetry or music. They speak to the feelings rather than to the intellect, and hence probably their power to please.' (3)

VIII

Johnson's view of general propositions had a marked influence on his own writings. No author has been more generous in supplying specific examples to illustrate his meaning. In fact, the examples constitute the excellence of his work. He himself repeatedly reminds us that such general propositions as he can frame to sum up his critique of language are hopelessly obvious, and that it is only from their continued application that any benefit can be derived. He knew that no linguistic reform could overcome the difficulties he spoke of: 'Indeed, I can afford no better guide to lead you ultimately to a correct understanding of the defects of language, than to say, at a hazard, that I allude to no defects that you ever heard of or conceived. I also allude to none that can be obviated. The most that I hope to perform is to make them known; as we erect a beacon, to denote the presence of a shoal which we cannot remove.' (2) And, far from advocating some reform to improve language, he said: 'A better philosophy floats in our colloquial phraseology than phraseology receives credit for.' (3)

Johnson later suggested, for the use of philosophers (who insist on making statements never made in colloquial usage), the indication of the sense of certain words by affixing an appropriate index; as S for sight, F for feel, etc. For an example, he thus translates a sentence of Hume's: *'The table* (S) *which we see, seems to diminish* (S) *as we recede from it, but the real table* (F) *suffers no diminution* (F). The whole zest of the proposition consists in the sensible duality of each of the nominal units table and diminution. That the sight table exhibits a visible diminution (S), while the feel table suffers no tactile diminution (F), are no contradiction of one another. That the sight diminution and the feel undiminution can exist thus together, is a

physical fact of much interest; but we can make a mystery of it only when we play at bo-peep with words.' (3)

IX

After discussing the limited significance of general propositions, the argument of the original lectures proceeds thus:

'A principle as fundamental as any of the former, and more essential . . . to a just apprehension of human knowledge . . . is this—language can effect no more than to refer us to phenomena. In painting we are forced not only to delineate objects with the colours, how incongruous soever, that we possess; but there are numerous existences to the delineation of which all colours are inapplicable. Even to intimate that colours are unable to represent sounds, tastes, and smells, seems absurd from the obviousness of the fact.

'The boundary which separates the phenomena that may be represented by colours from those to which colours are inadequate, is, therefore, sufficiently defined; but no writer has imagined that there is a limit beyond which words also cannot discourse. Nor is the latter position easily conceived, for we can no more exemplify with words that there is a limit to their applicability, than a painter can demonstrate with colours that there are phenomena which colours cannot delineate.' (1)

'If I have never heard a cataract, you may inform me what the sound is like; and if I have heard the similar sound, I shall be instructed; but language, nor any other agent, can effect no more than such an approximation. Should you wish to acquaint a child with the sound of a cataract, his conception of it will probably be very erroneous; not because his faculties are less acute than yours, or language less operative on him than on you; but because his experience is less than yours, and language can be significant to him of his experience only. If he has heard no sound more consonant, you must refer to even the lowing of an ox. You may qualify the comparison, by saying the cataract is awfully louder; but if he has heard nothing louder, the qualification will not add to his instruction, except that it may teach him he is still ignorant of the correct sound of a cataract.' (1)

'We possess words which signify phenomena only, as white, sour, pain, loud, &c, and . . . other words which sometimes signify phenomena and sometimes words; as estuary, shipwreck, murder, &c. We have still another class: words that never signify phenomena, but words only . . . Infinity is an example of this class. It is never a sight, feel, taste, or smell; nor is it a sound, except as it names other words.' (1)

'When Locke says that the meaning of rainbow can be revealed to a person who never saw the phenomenon, provided he has seen red, violet, and green, &c., Locke is alluding to the verbal meaning of rainbow. This meaning can be known to the blind. . . . But it may be thought, we are differently circumstanced from the blind; and that an enumeration of the colours of a rainbow, and of their figure, size, position, and arrangement, to us who know the phenomena which the words signify severally, would reveal to us a rainbow, not verbally merely, but visibly.

'The premises are, however, impossible. No person can have experienced the colours which compose a rainbow, and their figure, position, and arrangement, without having seen a rainbow. Take any one of the colours, say red; it names not one sight only, but numerous sights. Fire is red, blood is red, my hand is red, bricks are red, and an Indian is red; which of these is he to imagine, when you speak of the red of a rainbow? The same remark

will apply to the other colours and to their figure, positions, and arrangement.

'But admit the possibility of the premises, and that a person who has never seen a rainbow, shall still have seen all its colours. Admit further, that when you enumerate the colours, he shall guess the precise red, orange, yellow, &c., to which you refer; and admit the like of their figure, size, and position; yet it will be impossible for the person to know how the colours will look when they are combined; much less, how they will appear, when drawn into the shape, size and position of a rainbow. If he has seen such a combination, he has seen a rainbow; but if he has not seen the combination, language is inadequate to reveal it. After the most copious definition . . . . a person will be conscious of a new sight the moment he sees a rainbow.' (1)

X

In the original lectures, the development of the four principles outlined above completed Johnson's presentation of what he regarded as the fundamental properties of language. He followed them with an examination of the conditions which govern our assent to certain propositions, stating his views on logic. 'We assent to a proposition when we find that the premises affirm the conclusion. The most elaborate reasoning, and the most recondite, can effect no more than to show us that the conclusion is admitted by the premises. . . . When a writer finds that his conclusions are not obviously admitted by his premises, he will so explain the premises as to show that they do embrace his conclusions.' (1)

'Every object, how gorgeous soever its colour in the light, is void of colour in the dark. Perhaps you will not assent to this proposition, though you will admit that colour is invisible in the dark. Natural philosophy proceeds, therefore, as follows: *colour is the reflection of certain coloured rays of light.*

'Admit this, and objects become remedilessly void of colour in the dark. If you cannot apprehend this consequence, the following arguments may convince you, for they will show you that the consequence is included in the premises:—thus, colour is nothing but the reflection of certain coloured rays of light; hence, where no light exists, no reflection of coloured rays can exist; therefore, all objects are void of colour in the dark, however they may be endued with the conformation of parts that adapts them to reflect in the light its most gorgeous rays.' (2)

The above example is followed by an excellent footnote, which I offer in lieu of further extracts on the present topic: 'When a tradesman brings me an account which asserts that I am his debtor, say a hundred dollars, I may be sure that the aggregate is fairly stated, for few men are careless enough to commit an errour in addition. The items of the bill may require examination. So, when a logician tells me the conclusion to which he is arrived by any process of argumentation, I seldom care to investigate his arguments. I assume that he will not make a false deduction, any more than the tradesman will make a false addition. The part which requires examination are the logician's premises; these are like the tradesman's items. Most people, however, waste all their attention on a logician's arguments, and let him assume what premises he pleases. This is analogous to permitting a tradesman to charge you without restraint, provided he will be honest in his addition of the items.' (2)

XI

The necessity of our assent to implied propositions, Johnson goes on to say, is founded upon our experience. 'Why can-

not the same spot be, at the same time, both white and black? Because the word white implies that the spot is not black. But how came white by this implication? Was it arbitrarily imposed by the framers of our language? No. They called one sight white and another black, merely to name what they saw. That proposition is a result of experience. If I assert that the same spot cannot be both white and hard, the proposition will be untrue. Why? Because my senses can discover such a coincidence. There is no other reason.' (1)

But once we have, by sensible experience, established a relation of implication between certain words or phrases, we can go on applying it in cases where no sensible phenomena are present. This, in Johnson's opinion, is the basis of nearly every metaphysical speculation. 'Such a use of language is like the trick of a juggler who, having adroitly conveyed a shilling from under a candlestick, talks of the money as still under the candlestick.' (1)

'What is the meaning of created? It is a name applied to certain phenomena. Any of my senses will teach me a signification of the word. I can see a brick-maker create bricks. I can hear sounds created. You can tell me to place a piece of sugar in my mouth, and it will create a taste; or to press my hand against a needle, and it will create pain. Each of these processes furnishes a meaning of the word created.

'But what do I mean by applying the word created to the sun? When I apply it to bricks, I refer to the process by which I have seen bricks produced; but when I apply it to the sun, I refer to nothing but the sun itself.

'But do I not see that the sun exists, and must not every existence have been created? Here again the necessity is verbal, and language is a contrivance of men, and relates to their operations only. Why must every brick have been created? Try to cause the existence of a brick, and you will discover. . . . When we apply the same language to the sun, the necessity is merely verbal. It refers to nothing, and signifies nothing.

'To persons who have never esteemed language as a collection of mere sounds employed to designate men's operations and experience, I am aware that this doctrine must be abstruse. That nothing can exist without a previous creation, is, besides, a proposition which applies significantly to so many objects, that there is but little wonder it should be deemed universally applicable. . . .

'If all tactile objects possessed a sweet taste, we should consider sweetness essential to the sun, in the same manner as we consider a commencement essential. We even now attribute to the sun temperature, gravity, density, and every other property that is constantly associated with the bodies which we can handle.

'But it may be asked whether I mean to assert that the sun's existence never had a commencement? No. I mean only, that commenced has no signification but as the name of some phenomenon; and when applied to the sun, there is no phenomenon to which the word refers: hence it is used insignificantly. We should err equally, if we were to assert that the sun never had a commencement; for we must remember that the meaning of a word is governed by the phenomenon to which the word refers. To apply the word bitter to the sun will not affect the sun, but it will affect the word. It will render the word insignificant. . . .

'I am aware that this doctrine is so novel, that I may be accused of saying that the sun had no creator. I hold, however, that such an assertion is no more significant than its converse. Language is impertinent to the whole subject. The

phenomena to which words refer give them significancy; and when we employ a phrase without referring to any phenomenon, the words are divested of signification. That the sun was created is highly significant, when we refer to the declarations of scripture; but when we refer to nothing, our assertion signifies nothing.' (1)

XII

Johnson's books on language abound in examples of the use of words insignificantly (in the above sense) by philosophers, theists, and scientists. It is hard to resist the temptation to include a dozen of them, but it would be equally difficult to select the best from the scores that he gives. Instead, I have selected some of Johnson's remarks on the construction of theories to close this series of extracts from his books.

'In a new colony the various necessary utensils are framed of such articles as the region yields. From the absence of more suitable materials, I have seen wooden latches, wooden wash-bowls, wooden candlesticks, and even wooden wicks. Theorists are similarly limited in the agents which they employ. Where language is a scanty vocabulary of spontaneous phenomena, the rude philosopher must theorize with the gross agents which surround him. The earth is then supported on the back of an elephant, and the elephant on the back of a tortoise. But why not a butterfly? Because he refers to his experience of the strength of an elephant, and the endurance of a tortoise. . . .

'We smile at theories in which the agents are so crude; and from the numerous phenomena that industry has accumulated for us, we select instruments more subtle. . . .

'If a philosopher were to account for the fall of bodies by saying that matter has an inherent love for matter, we might estimate this a very rational exposition. We experience that love produces a desire of contaction, to which the fall of bodies is sufficiently congruous. I wrote thus far without recollecting, that love has been an agent in theories. Chymists employed it in the composition of bodies. Nitric acid and copper combined, because they had a strong affinity for each other. The acid would leave the copper and unite with iron, because its love for iron is stronger.' (1)

'Combustion . . . was formerly produced by phlogiston, a very subtile and insensible agent which combustible bodies emitted when heated to a certain temperature. This phlogiston was so light, that some bodies became heavier by losing it. When a theory is driven to conclusions so repugnant to our operations, its dissolution is near; accordingly, phlogiston had soon to relinquish its agency in combustion to a more accommodating instrument.

'Combustion is now performed by means of oxygen. When combustible bodies arrive at a certain temperature, the oxygen loves to unite with them; and as it thus passes from the form of air, to a fixed state, it liberates the caloric which distended it, and for which it has no longer any occasion. The deserted caloric scatters indignantly, and is the heat which we experience.

'This theory is congruous to a great number of phenomena, and may never be superseded; still, like every other theory, it is significant of nothing but the phenomena which are adduced in proof of the theory. That combustibles will not burn without oxygen, that the residuum &c. of burnt phosphorus will acquire by combustion as much weight as is lost by the air in which the phosphorus is burnt, and that the remaining air will be devoid of oxygen, are truths

which I do not dispute. Still, that the oxygen unites with the phosphorus, and that the heat which ensues is the discarded caloric of the oxygen, are the mere verbal machinery by which we reconcile to our own operations the phenomena which we discover.

'Why must the heat which ensues have existed in the oxygen? Because no other source accords so well with our experience. This is a good reason while it lasts, but a similar reason may induce us tomorrow to attribute the heat to another cause. The language is truly significant of the phenomena only to which it refers; and with this limitation we can never err, adopt what phraseology we please.' (1)

XIII

Such, then, are the views which A. B. Johnson first formulated on the nature, structure, and meaning of language. Naturally, his later works expanded them in many respects and modified them in others. To present them critically, or even to discuss their further development at his hand in later years, would require very extensive study. Whether he had been anticipated by other writers, I do not know; but whatever else may have been written on the subject of language, Johnson's contributions display every mark of originality and profound insight.

That they were not correspondingly well received is no surprise. Far from having any academic standing, Johnson was without formal education beyond the age of fifteen. Philosophical studies in American universities at the time were practically limited to theology, a field in which some of Johnson's remarks were more likely to raise eyebrows than hats. Dr. Timothy Flint praised Johnson's work in a review of American literature which appeared in the London *Athenaeum* in 1835, and suggested that its publication in England instead of America might have gained it the attention that it merited.

Johnson believed that a knowledge of the nature and structure of language must underlie the pursuit of all other sciences. He hoped to point the way to a non-metaphysical philosophy of human knowledge. Whatever his success or failure, his intentions were clear:

'Speculative researches are accommodating to human weakness. From geology, which teaches us what exists in the center of the earth, to astronomy, which reveals what is transpiring in the empyrean; and from physicks, which discourse about the body, to metaphysicks, which treat of the mind; the mass of verbal doctrine assumes any shape which ingenuity strives to create—like the pebbles of Rockaway, that change their position as every wave, rising on the ruins of its predecessor, rushes, (lord of the moment,) proudly over the beach.

'To fix the fluctuating mass of theories, no man has suggested any other expedient than the construction of some new theory, to whose authority, (like to Johnson's orthography) all persons shall submit. The remedy is constantly augmenting the disease. I shall not imitate so unsuccessful a procedure; but as theories are the means by which we attempt to discourse of external existences that our senses cannot discover; and as the desire for such discourse originates a large portion of our theories; I will teach you the capacity of language for such an employment, and thereby enable you to judge more understandingly than you can at present, the utility of most theories, and the signification of all.' (2)

'Our misapprehension of the nature of language has occasioned a greater waste of time, and effort, and genius, than all the other mistakes and delusions with

which humanity has been afflicted. It has retarded immeasurably our physical knowledge of every kind, and vitiated what it could not retard. The misapprehension exists still in unmitigated virulence; and though metaphysicks, a rank branch of the errour, is fallen into disrepute, it is abandoned like a mine which will not repay working, rather than like a process of mining which we have discovered to be constitutionally incapable of producing gold.' (2)

In his *Reason and Nature* Morris R. Cohen drew attention to the fact that the very data of science depend absolutely upon the terms used in its exposition. Hence, he said, the invention of new technical terms often created new facts as in social science, economics, and psychiatry. People actually become introverts or neurotics because the terms are invented. So also when new terms appear in the International List of Causes of Death people begin obediently to die of the newly christened diseases.

Whenever a prominent medical specialist in any line affirms that one kind of disease of a certain organ is less common or less deadly than another, morbidity and mortality statistics soon reflect his pronouncement. Some years ago Sir James Mackenzie announced that myocardial affections were far more common than valvular affections of the heart; deaths from the latter promptly showed a sharp drop, while deaths from the former increased proportionately.

A physician, writing about this phenomenon, said that it resulted largely 'from the demands of "style," "vogue," or "fashion in medical thought." ' The manner in which the statistics were tabulated also made a difference. 'In other words the invention of new terms operates quite like the appearance of a new disease,' said this doctor. This is very striking and remarkable, but is little considered. In practical terms it means that we have yet little sound reason to hold that the death rate from heart disease or from cancer is increasing.

T. SWANN HARDING, 'Science at the Tower of Babel,' *Philosophy of Science,* Vol. 5, No. 3, July, 1938.

☆ DISCUSSION ☆

VOCABULARY TESTS AND INTELLIGENCE: A REPLY TO DR. GLICKSBERG

CECIL W. MANN *

JUSTIFICATION for the use of tests for the measurement of intelligence would be more convincing to some if a suitable and universally agreed upon definition of 'intelligence' could be found. It would be idle, however, to postpone the measurement of intelligence until all have agreed upon a definition. Electric currents, or at least their effects, were measured before a substantial agreement was developed concerning the nature of electricity. We are aware that electricity can turn wheels, provide light, cook a waffle and, in sufficient quantity, produce death; but we do not agree as to its 'nature.' That we are unaware of its nature would be regarded as a poor excuse for not paying our electricity bill. It is as interesting as it is important to remember that most measurements in physical science are indirect. Temperature is measured by the length of a thread of mercury; air pressure by the height of a column of mercury; electric current by its ability to turn an armature; sugar in solution by the rotation of a beam of polarized light, and so on. With as much justification, the psychologist employs indirect measurement in his study of intelligence. Side-stepping the philosopher's problem of what 'is' intelligence, he turns towards a functional approach to the question as to what, under varying conditions, can 'mind' do.

The measurement of intelligence, even by the indirect approach, demands the development of assumptions. Without adequate assumptive bases, success in measurement in any field would depend upon happy accident. Eight decades of scientific research have seen proposed a number of assumptions with respect to the nature of intelligence. As long ago as 1885 Ebbinghaus suggested that 'intellectual ability consists in the elaboration of a whole into its worth and meaning by means of combination, correction and completion of numerous kindred relationships.' Meumann suggested that intellectual ability is 'the power of independent and creative elaboration of new products from the psychic material provided by the senses.' Binet, the originator of the modern intelligence test, believed that intelligent behavior was characterized by the ability to select and maintain a definite psychic direction, by the ability to make adaptations leading to a desired end, and by the ability to criticise one's own behavior. Spearman believes that intelligence functions in the process of educing relationships and corelationships. Terman believes that intelligence is related to one's ability to handle abstract relations.

In all these statements, there is one

* Professor of Psychology, Louisiana State University.

basic formula. Intelligent behavior is commensurate with the ability of the individual to comprehend and to make use of relationships. This is the mark of the behavior of the child who makes a kite, of the student attempting to apply the Theorem of Pythagoras to his class exercise, of the scientist investigating his hunch and of the professor stringing together sentences in the paper which he hopes will be published.

If these two assumptions be admitted, namely, that for the time being the measurement of 'intelligence' will be by indirect methods, and that 'intelligent behavior' is concomitant with the ability of the individual to comprehend relationships, the plan of 'intelligence test' procedure is plain. It is impossible to observe *all* of the behavior of the individual, therefore the test constructor must be content to assemble a sample of tests which are characteristic of culture and age levels over which 'intelligence' may function. An examination of the items in a well-constructed intelligence test, such as the Stanford-Binet Scale, will reveal that while the items are varied in form, all appear to demand of the individual in greater or lesser degree the ability to comprehend relationships. One of the groups of items is the vocabulary test.

The inclusion of any test item in the intelligence scale, not excepting the vocabulary test, is based upon the argument that, since intelligent behavior is a function of the comprehension of relationships, those tests which demand comprehension of relationships will correlate highly with whatever the test measures. This method is not unlike that of the investigator in physical sciences. He argues that the interaction of magnetic fields should, under certain conditions, produce rotation; he develops an electromechanical device which is subject to rotatory action commensurate with the interaction of the magnetic fields.

The relationship between the vocabulary test and the intelligence scale can be found by simple statistical methods. Wechsler (6, p. 101) found that 'the correlation . . . [between the vocabulary test and the] total score on the rest of the scale is .85.' Terman and Merrill (5, p. 302) state that 'it [the vocabulary test] agrees to a high degree with the mental age rating on the scale as a whole; correlations for single age groups range from .65 to .91, with an average of .81.' In his careful statistical analysis of the Stanford-Binet Scale—one of the best individual tests—McNemar (2, p. 140) states that 'the magnitude of these correlations (between vocabulary test and the total mental age score) indicates that the vocabulary test alone constitutes a good rough measure of intelligence.'

In his recent article in *ETC.* on 'Vocabulary and Intelligence,' Dr. Glicksberg (1) arrives at the conclusion, with some reluctance, that there is some relationship between vocabulary tests and intelligence. But he should note that the relationship is not invariable; psychologists do not believe that there is an 'invariable relationship between size of vocabulary and greatness of intellect.' The relationship is significant, but it is neither invariable nor is it perfect. In a perfect relationship, the correlation would be either $+1.0$ or -1.0. If the average value of .85 given by Terman and Merrill be accepted, it is possible to state that while the intelligence test score is dependent in some measure upon the vocabulary test score, no less than 53% of the total variables which determine the total intelligence test score is unaccounted for. It is for this reason that test constructors do not stop with the vocabulary test; Wechsler has included ten ad-

ditional tests, Terman and Merrill have an additional four score or more.

The evidence seems clear. A relationship does exist between vocabulary test score and intelligence test score. It is a relationship which is neither invariable nor perfect; it is sufficiently significant to be of great importance in the development and application of intelligence tests.

In spite of his reluctant acceptance of a relationship between vocabulary test score and intelligence, Dr. Glicksberg does not have much faith in the former. He declares (1, p. 97) that 'the vocabulary test does not achieve its declared aim; it does not measure intelligence.' If he intends the phrase 'measure intelligence' to mean 'measure intelligence perfectly' then all test constructors are in complete agreement with him. But then, no measuring device measures perfectly. There are errors of measurement in the most carefully designed and constructed physical measuring devices, barometers, voltmeters, and thermometers. But we do not discard any of these as worthless; we use them and modify our interpretations in terms of their known errors of measurement. The implication that vocabulary tests either 'do measure' or 'do not measure' is to make 'measure' a two-valued word, and is this not inadmissible in a paper on general semantics? Prudence as well as general semantic principles would incline to the use of 'measurement of intelligence' as a multi-valued symbol, and we are justified in asserting that vocabulary tests do measure intelligence to the extent that one is related to the other. That is essentially the meaning of correlation in this aspect of its application; it is the mathematical description of the multi-valuedness of relationship.

Most psychologists would join with Dr. Glicksberg in protesting Johnson O'Connor's implication that a knowledge of mere dictionary meaning constitutes vocabulary and that this kind of vocabulary is an important factor in success. But few would agree with Dr. Glicksberg that in the vocabulary test 'the light is focussed on the bare, skeletal aspect of words; the connotative complexity of word in action is ignored.' (1, p. 95) In the volume of Wechsler (6, p. 101-2) quoted by Dr. Glicksberg, one may read, 'Apart from its value as a measure of intelligence, the Vocabulary test is an especially desirable test to have on any scale, because of its qualitative possibilities. In defining a word, the subject gives us more than its mere meaning. In many instances, he tells us a good deal about himself, or, at least, about the quality and character of his thought processes.' Terman and Merrill (5, p. 303) insist that 'it is important for the examiner to realise that the purpose of this vocabulary test is to determine whether the subject knows the meaning of the word, not whether he can give a completely logical definition.' Test constructors do not make vocabulary tests that demand the recall of definition; like Dr. Glicksberg, they insist that 'words cannot be exiled from their native habitat.' Plainly, the psychologist interested in test construction eschews the vocabulary test which requires simple recall of dictionary meaning in favor of one in which the subject is required to exhibit his comprehension of the relationships involved in the meaning of the word.

With Dr. Glicksberg's main contention, namely, that 'intelligence is not developed by the extension of vocabulary,' most psychologists would agree. It is true that the correlation between the vocabulary test and intelligence is both positive and significant. Logically, however, there is nothing in correlation, mathematically defined, to suggest causality. Dr. Glicksberg would probably agree that among the total number of professors of English in the United States, there is a correlation

between professional interest and number of books in their libraries. But surely this cannot be construed to mean that the possession of a large number of books makes a professor of English. The psychologist does not claim that success in college and life is causally related to size of vocabulary; this would be to fall victim of the *post hoc, ergo propter hoc* fallacy. What he does claim is that both richness of vocabulary and success in college and life are probably greatly influenced by intelligence. Psychologists will join with Dr. Glicksberg in deploring O'Connor's implication that intelligence can be increased by extending the vocabulary; many will be equally chagrined by the substitution of the term 'Human engineering' for 'psychology.'

In conclusion, Dr. Glicksberg's article proposes a few questions which one would like to ask by way of enlightenment. What, for instance, is the meaning of 'buttressed with flying graphs and piles of figures, then the case in court is seemingly won?' One hears of flying buttresses and some people are interested in graphs. But 'flying graphs?' And, put in a court to win a case? Could this phrase have some esoteric meaning, or is it merely a 'loaded' symbol designed to produce the right kind of undelayed reaction in a half-prejudiced mind? What, moreover, can the 'essential and redemptive discipline of experience' mean? One might, after a visit to the state penitentiary or mental hospital be rather dubious concerning the redemptive value of the discipline of experience; and, of course, with cyanide cheap these days, some even deny that experience is essential. There is no dearth of evidence to show that experience exerts little discipline on some; on others much. Could this phrase be one of the 'verbal fetiches' referred to by Dr. Glicksberg?

One last request is that Dr. Glicksberg will let us in on his secret evidence that 'our vocabulary grows in geometric progression as the result of our interaction with things and people in our social environment.' Does 'geometric progression' have a word-to-fact relationship for which there is scientific evidence; or is it another 'prestige' symbol so frequently eschewed in general semantics? Would this geometrically progressive growth in vocabulary be true of everyone; that is, is it universal law or local gossip?

REFERENCES

(1) GLICKSBERG, C. 'Vocabulary and Intelligence,' *ETC.*, I, 92-98.
(2) MCNEMAR, Q. *The Revision of the Stanford-Binet Scale.* New York: Houghton Mifflin, 1942.
(3) O'CONNOR, J. 'Vocabulary and Success,' *Atlantic Monthly,* 1934, and in *The Harbrace Omnibus,* New York: Harcourt, Brace, 1942.
(4) TERMAN, L. M. *The Measurement of Intelligence.* New York: Houghton Mifflin, 1916.
(5) TERMAN, L. M. & MERRILL, M. A. *Measuring Intelligence.* New York: Houghton Mifflin, 1937.
(6) WECHSLER, D. *The Measurement of Adult Intelligence.* Baltimore, Md: Williams & Wilkins, 1941.

ADOLF HITLER AND WORDS

F. K. RICHTER

IF there has to be a comparison between Napoleon and Hitler, let it be this: Napoleon knew as well as Hitler knows the tremendous importance of words. Of course, Napoleon feared and respected the printed word and called the press the sixth world power. Hitler emphazises the power of the spoken word. He loves and

fears it. Words exercise a certain spell upon him, they send him down to his gloomiest moods and fears, or they throw him into the other extreme of paranoic delight. Dr. Kurt Krueger, Hitler's Munich doctor, tells in his psychoanalytic report that his patient Hitler gave him the following answer when first asked about his physical condition: 'I guess I've nothing more or less than the old French sickness.' Dr. Krueger did not like that label of the disease and replied: 'You mean syphilis?' Hitler soon explained: 'Forgive my having taken you so far afield, Doctor. The truth is, I just don't like the word syphilis.' [1]

This story may just be a story, and, indeed, I have definite doubts about parts of Dr. Krueger's reports. The mere fact that they are prefaced by Otto Strasser should be reason enough to make the reader sceptical. But Hitler's whole life and behavior proves his domination by words and his desire to dominate others through them. Since he has a distinct two-valued orientation, his words are 'black' or 'white.' It is not too extravagant, I hope, to remember that black was also the first color that impressed him as a child. He told his doctor that he could never forget the blackness of his mother's clothes, any more than he could forget the light blond hair of a little girl (who seems to be an imaginary figure born out of his mother-complex).

This black-white pattern has been characteristic of Hitler's entire behavior. There are 'good ones'—Aryans—and the 'Jews,' there is Munich and Versailles, Nazism and Communism; the white side always reads National Socialism; the dark side, always the Jewish 'race.' There is an impenetrable wall between these two colors, and the slightest contact of a white unit with a dark one is a crime, sin, high treason (for which the *dark* must be punished).

This two-valued orientation is mirrored in Hitler's vocabulary. A 'bad' word, like syphilis, will immediately conjure up other images like 'street walkers' on account of the poverty through Versailles, for, of course, all street walkers are 'Jewesses,' 'because they have no shame.' 'Jewish' will nearly always be the last link, pronounced or not, in his litany of dark words.

On several occasions I have listened for hours to Adolf Hitler. His black-white pattern is certainly one of the most successful and powerful weapons I could detect in his personality. It is dangerous because it is such an easy device, so convenient. It does not require thinking: *the pattern does the thinking for you.* It is contagious, and people will reach for it as for a new gospel. Consequently in most cases it was impossible to reason with Hitler's followers, because they knew only two colors.

The 'white' words, as I said, elevate the Führer into ecstasy. I recall a mass meeting in a big eastern city. The crowd, about 30,000, had poured in by noon, although Hitler was not to speak until eight o'clock that evening. The people passed their time in singing, and in doing so, they worked themselves into a state of trance. But Hitler was very late that night. By ten o'clock his plane had not yet arrived. A crowd behaves on such an occasion like a woman whose lover doesn't show up. Many became angry. Finally, Hitler arrived. He looked extremely annoyed, and there was no smile under his moustache. It was a rainy November night, but the Führer appeared in a white summer coat, a riding whip in his hand. There was no contact between the longing crowd and this Führer. A great disappointment, one could tell. The audience, which usually shouts and

[1] Kurt Krueger, *Inside Hitler*, New York, 1941, p. 33.

sings when he enters, saluted in silence.

But then the miracle happened: while Hitler approached his platform in that unusual quiet, a voice of a little boy was heard: 'Unser Führer!' These two words had such an effect upon him that he smiled. Then the crowd forgave him and started shouting and singing. The phrase had worked the change. Indeed, 'Unser Führer' is the brightest of all expressions to Hitler, the one that covers all goodness of this world, just as 'Jew' covers all evil.

If Hitler's book *Mein Kampf* had not been revised by a Viennese professor who corrected the style and made a book from mere Landsberg prison manuscripts, a study of style would be more profitable. The black-white orientation of the Führer is indeed still obvious on practically every page, but the choice of words is more cautious than his nature and temperament require. The improving pen of a scholar is felt everywhere, and the *Kampf* therefore is not so valuable for semantic research as are reports from people who have had direct contact with Hitler.

The two-valued orientation as reflected in his vocabulary is certainly not typical of Hitler alone. Most ministers, many teachers and journalists, Mrs. Dilling and Aimee Semple McPherson possess it likewise. But—and this can't be stressed enough—Hitler knows the vicious effects of this device and uses it more effectively and unreservedly than anyone else.

I remember very well that this black-white representation was taught to speakers for the National Socialist Party. The Führer himself points out: 'The great masses' capacity to absorb is very limited, their understanding small, and their forgetfulness great. For these reasons any effective propaganda must be confined to a very few points, and must use these slogans until the very last man cannot help knowing what is meant. The moment we give up this principle, and try to vary things, we dissipate our effect, since the crowd can neither digest nor retain what we offer it. This again weakens and finally destroys the results.' [2]

[2] Adolf Hitler, *Mein Kampf*, Stackpole, 1939, p. 181.

NEW PATTERNS FOR DEBATE

WILBUR E. MOORE *

MY first criticism of the 1942 pattern of intercollegiate debate is that it rests upon an outmoded Aristotelian logic which has as its basic postulate the law of identity and the law of the excluded middle.

The typical unit of thought in debate is the logical proposition, which is traditionally conceived to be the expression of a judgment in words, and which identifies the subject with the predicate (Hitler is mad, The League of Nations was a failure), or excludes the subject from the category or quality expressed by the predicate (Hitler is not mad, The League of Nations was not a failure). The logical proposition as a unit of thought rests upon the law of identity (A is A) and

* Wilbur E. Moore teaches at Central College of Education, Mount Pleasant, Michigan. His remarks are condensed from an article of the same title which appeared in *The Forensic* (journal of Pi Kappa Delta, honorary debating fraternity), January, 1943.

the law of the excluded middle (everything is either A or not-A). This form of judgment can at once be seen to have no place for a continuum or relativity. Yet, actually, life facts can seldom be classified as A or not-A. For example, if we think of a continuum from 0 to 100 with 0 representing complete uselessness or failure and 100 representing perfection or complete usefulness, and if we could secure the opinions of a large number of the most competent authorities and quantify them, we should likely find that the League of Nations would be placed somewhere between 0 and 100. In debate, how often are such judgments heard? Rarely, if ever. Instead we hear, 'The League of Nations was a failure,' or 'The League was successful.'

Likewise, the logical proposition is inadequate to express the dynamic nature of life processes. It represents events, institutions, objects, etc., as static and isolated facts. For instance, three years ago, students were asserting with considerable feeling, 'A neutrality law will keep the United States out of war, because it will keep American ships out of the war zone.' Such judgments represent the complex and dynamic relations between nations as simple and static. They omit, and must inevitably omit, the possibility of new relationships, new policies, like the aggressions of Japan and the attack upon Pearl Harbor.

Similarly, several years ago, a team that won a national tournament had as an important argument, 'The inflation of credit is the cause of depressions because an inflation of credit has preceded every depression in the history of the United States.' It then proceeded to enumerate the depressions which had the inflation of credit as an antecedent. The team oversimplified the multitude of factors accompanying each depression, and differentiated all characteristics of the different depressions except the single one, the inflation of credit. Such judgments reveal regretful naiveté in the fields of historiography and the social sciences. Charles A. Beard states in *The Discussion of Human Affairs:*

> The unreality of the theory of historical causation is more strikingly evident when chains of causes are abandoned and a specific cause is introduced to 'explain' or 'account' for a specific event . . . . . .
>
> The theory of closed, positive, and mechanistic causation in history has been rejected by contemporary historiography, as distinguished from the assertions of writers called 'historians.'

A graver and more dangerous characteristic of the logical proposition which identifies the subject with the predicate is that it leads the individual to 'project' to the outside world a quality which exists only as a reaction within his own nervous system. When one says, 'The League of Nations was a failure,' he, in all likelihood, thinks of the quality of failure inhering in the League. In reality, the true significance of 'failure' is that it is a label which, by the functioning of the nervous system, has been attached to the other label, 'The League of Nations.' A simple illustration will make the matter clear. If we have three beakers of water, one containing water 50° Fahrenheit, the second water 98° Fahrenheit, and the third water 130° Fahrenheit, and if we first place our left hand in beaker number one and our right hand in beaker number three and then place both hands in the second beaker, the water in it will feel warm to the left hand and cool to the right. *The quality of warmth or coolness does not inhere in the water.* It is instead the reaction of our nervous system to a

configuration of stimuli. What we know of the world is known only through the reaction of our nervous system to different types of energy in the world outside our skins. Whether that reaction be to the words of the books we read or to the energy of warm and cool water makes little difference. It is determined by a configuration of stimuli, and as configurations of stimuli are infinite in variety, the nervous systems of different persons will be variously stimulated and the reactions, evaluations, and interpretations will be infinite in number. Hence it is delusional thinking to 'project' to the outside world a quality which exists only inside our skin. The debater who asserts that the facts presented by his opponents are not the *real* facts, who proclaims that his prophecies are the only *true* prophecies, is 'projecting' to the outside world his meanings and evaluations and reacting to them as if they were the true picture of the outside world. . . .

In the second place, the current form of debate leads to verbal misrepresentation of world facts in that it depends upon 'unqualified predictions.' Listen to nearly any debate and you will hear prophecies of evils sure to befall or of things wonderful to behold if a particular policy is adopted. There is, generally, little restraint in the making of predictions. Anyone who has attended any of the meetings of the American Academy for the Advancement of Science and has heard from scholars the cautious descriptions of data suffers something of a shock when he hears immature youngsters who have spent a few months studying a proposition making unrestrained predictions about what will result from the acceptance of a certain policy. It seems something of a travesty on sane and cautious thinking for well trained teachers to tolerate, even if they do not encourage, such irrational practices. . . .

I sincerely hope that no reader will infer from what I have written that I believe few values exist in debate. As one who debated four years in college and directed debate for fourteen years, as one who has manifested most, if not all, of the 'un-sane' behavior lamented in this article, I believe that much value comes from long and patient study of a topic, from frequent discussions, from having errors in reasoning exposed, from practice in the analysis of a problem and in the synthesis of the data which tend to suggest a solution.

These values, however, can be retained without clinging to a form of debating which seems to have inherent in it the regrettable characteristics I have described. The changes would not need to be extensive. They would be incisive.

The major alteration would be to abandon the logical proposition as the basis of debate. Instead of a debate proposition, a question should be used. The question should be so worded that the qualifications and cautions which ought to be imposed by our inability to see into the future would be foremost in the speakers' minds throughout the discussion. For example, this year's subject might be phrased as follows: 'In light of the "present" world situation what plans for post-war reconstruction should we now consider as most acceptable?' The word 'present' would, of course, have different meaning as the year progressed and would have different significance to different persons. That fact should always be recognized. In the analysis of such a question we would be aware that the events of tomorrow might alter completely our considerations of today. For example, if we are realistic, we must foresee the *possibility* of serious friction between Britain and Russia. Yet it would be foolish to base our analysis on the supposition that such friction *will* exist.

In addition to this major change, other changes, chiefly in the attitude of coaches and debaters and in the methodology of analysis, reason, and critical examination of ideas presented in the debate, would have to be made. I submit a few of the more significant ones:

1. The pattern of discussion should place a premium rather than a penalty upon each debater who, no matter how much better prepared than others, was always aware of the incompleteness and inconclusiveness of his information and of the limitations of the inferences drawn from it.

2. The pattern of discussion should place a penalty upon the making of unqualified predictions. All predictions should be discouraged. (The purpose of discussion should not be to make prophecies but to prepare the speaker as well as the audience to meet all contingencies that can be foreseen as possible).

3. The pattern of discussion should place a great premium upon thorough description of the dynamics of world facts.

4. The debaters should be trained to distinguish their inferences from their descriptions.

5. The debaters should be trained to be aware of abstracting and of any confusion of lower or higher orders of abstraction.

6. The pattern of discussion should place a penalty upon 'identification and projection.'

7. The pattern of discussion should place a premium upon the debater's readiness to incorporate 'reliable' data provided by his 'opponents' in his evaluations and interpretations.

The preparation which teachers as well as students would have to make to develop the new pattern of debate would not be little nor easy, but it would be challenging. We could at least work with the assurance that our new techniques were derived from the latest contributions of the science of word-fact relations and that they met with the approval of 'psychologists,' 'educators,' 'social scientists,' 'mental hygienists,' etc., who now look with disfavor upon debate.

SOMETHING NEW IN TEACHING GRAMMAR

EDWARD J. RUTAN[1]
ENGELBERT J. NEUMAYER[2]

TEACHERS of English who are discouraged with the results obtained in teaching grammar by the old-fashioned method of drill, and who are unwilling to give up grammar altogether — as so many have done—would do well to try the tonic effect of linking grammar to the meaning of the sentence, which is where grammar belongs. Some of the newer discoveries in language-training over the past ten years have shown the way to making this old discipline one of the most refreshing in the school curriculum.

In order to connect grammar to the meaning in the minds of the pupils, and to show the particular work done by each part of speech in making the sentence say what it is saying, sentences are presented in which the one grammatical unit that is being studied *has been left out.* There should be no typographical indication of where the word or words belong. The

[1] English department, Memorial High School, Millville, N. J.

[2] English department, Eastside High School, Newark, N. J.

sentence as presented 'doesn't read right.' Something is missing. The pupils develop a sentence sense by seeking to supply the element without which they can't go on reading. The clue is always in what the sentence is saying; and the work done by the missing word is brought sharply to their attention as they try one or another way of filling out the sentence and making it say something.

Here is a sample exercise made up of five sentences that tells a little story; but from each sentence, the subject is missing and an appropriate word must be found to do its work. The instructions are: *A word is missing in each sentence. Find where it is missing. See how many different words will fit. Choose the one that fits best.*

Here are the sentences: *The taxied across the field. Gained speed and left the ground. The rose higher and higher. High in the air looked like a silver bird. Soon the disappeared from view.*

Note that the pupil must first discover what the sentence is saying. As he reads these five sentences, and the meaning unfolds, he discovers that the missing thing that does something in each sentence is an airplane; that it is highly important to the meaning; that sometimes the word 'it' is needed to refer to it; and that the missing word, whether 'airplane' or 'plane' or 'it' does the same kind of work in each sentence. He has discovered the subject and has found it by pursuing his own natural curiosity to know what is the meaning of the story before him.

Exercises of this character are excellent training for careless readers, for they require a close scrutiny of what is on the page. To enhance this value without detracting at all from the grammatical study, it is well to put one complete sentence somewhere among the sentences that tell the story. Let the complete sentence occur unexpectedly, in a different place each time.

To show that this device may be used for more advanced work in grammar, and that every grammatical notion may be taught in this way, here is a sample exercise illustrating clause usage. *Find what is missing in each sentence. Rewrite the sentence, putting in the words that fit best. What you have put in each sentence is called a* CLAUSE. *Underline the word it modifies.*

Here is the exercise: *A basketball coach selects his team from the fellows. One thing is regular attendance at practice. A player cannot get on it again. The fellow is the manager. Only the fellows play in a regular school game. The second team also plays, but the varsity plays the game. The man is the referee. Discontinued dribbling is one thing that is not permitted. A team wins many games. Basketball is a sport.*

These exercises, and similar ones, have proved themselves in actual classroom practice. Often pupils have made their own exercises, omitting words or grammatical elements in an effort to stump their classmates. From these exercises can come longer narratives and even compositions, which the whole class can test by determining the meaning, and coming to a class agreement about it.

When a pupil becomes aware of the meaning of what he says, reads, or writes, he no longer disregards grammar. For him this new approach becomes a creative activity. When he has completed each exercise, he has 'made sense' with words, and has created something that is meaningful to himself and to others. He learns the parts of a sentence by supplying them when they are missing. When he himself changes the meaning and emphasis of a sentence by his own manipulation of a phrase or a clause, he truly learns the function of these elements.

This approach to grammar need not

short-cut anything. All the grammar necessary for student purposes can be handled in this way. Nor does the terminology need to be omitted. Whatever the teacher is accustomed to put in the course or unit may be brought in through exercises of this character. And the best thing about it is that it is fun, both for the teacher and for the class. It is grammar without dread, without tears, and without the confusion of trying to remember something you were merely told.

The evil produced by the Aristotelian 'primary substance' is exactly this habit of metaphysical emphasis upon the 'subject-predicate' form of proposition.

. . . the subject-predicate habits of thought . . . had been impressed on the European mind by the overemphasis on Aristotle's logic during the long mediaeval period. In reference to this twist of mind, probably Aristotle was not an Aristotelian.

A. N. WHITEHEAD, *Process and Reality*

◆

The abolition of Newtonian metaphysics is the change of deepest significance for the common man that has occurred since the *Principia* in 1687 fixed the absolutes of space and time in the popular mind no less firmly than in the scientific. Though the man who knows little or nothing of science, and who has heard of relativity only as a month's sensation in the press, may be unaware of what changed his mind on so many things in less than a generation, it was the collapse of Newtonian absolutism that started the radical transformation of his attitude toward all absolutes, all authority, and all tradition. The change is still stubbornly resisted, especially by the humanistically educated; but not even unteachable reactionaries and vestigial mediaevalists believe in their hearts that a return to the Newtonian metaphysics of science is possible. . . . As the author of relativity has repeatedly declared, a single new observed fact may destroy the theory of relativity any day. So far the destructive fact has not appeared. But if it should, it would not necessarily be followed by an immediate return to Newtonian metaphysics. That, apparently, has gone forever.

ERIC T. BELL, "Newton After Three Centuries,"
American Mathematical Monthly, November, 1942.

✡ BOOK REVIEWS ✡

Two Dictatorial Regimes

TWILIGHT OF THE GLADIATORS: ITALY FROM THE INSIDE, 1939-1943, by Frank Heller. Translated by Llewellyn Jones. Putnam, 1944. $2.

GERMANY AND EUROPE: A SPIRITUAL DISSENSION, by Benedetto Croce. Translated and with an introduction by Vincent Sheean. Random House, 1944. $1.25.

IN *Twilight of the Gladiators* Frank Heller, Swedish novelist, tells in crisp narrative style the story of Italy in World War II. In *Germany and Europe* Benedetto Croce, probably the greatest intellectual of Italy, tells in ponderous, mazelike sentences the story behind the story of Germany in World War II.

What Heller tells about the fiasco-to-fiasco reactions of the Italians from 1939 to 1943 illuminates in certain important respects the erudite pronouncements of Croce. What you learn from Heller is that Croce is not always speaking for the Italian people generally, because his genius exceeds their grasp, and what you learn from Croce is that Heller's Italians do not always understand any too well what they are talking about and reacting to. The two authors complement each other in a sort of piggy-back fashion, with Croce doing the toting and Heller getting the popeyed youngster's perspective.

Twilight of the Gladiators is the more readable book; *Germany and Europe* is the more significant. Heller reports what everyone sees, and wonders what it means; Croce points out what few others see, and interprets it.

There is little point in summarizing the series of events recounted by Heller in *Twilight of the Gladiators*. You read the story day by day in the newspapers. Getting it all at one sitting, of course, makes it seem rather more preposterous than it appeared when read in serial form. The unpreparedness with which Italy entered the war, the ineptness with which she executed it, the buffoonery with which she went down to sprawling defeat make history of the Laurel and Hardy variety.

Heller asks himself a question which used to be a $64 one, but which now pays off at the rate of a tube of toothpaste: Was Mussolini a great man? He gives himself an interesting answer. 'If he did not become great it was because he let himself be drugged by a poison which is more dangerous than opium or hashish —by words. He talked so much and so often that at length he took his own words for reality and lost contact with the world.'

According to Croce, Mussolini had no substantial contact with the real world of Italy even before he started talking. Black was not the color of Italian shirts, historically speaking. In spite of Il Duce's twenty-year reign, Italy still belongs, by fairly general assent, to the community of nations. Heller shows and Croce explains why this is true: Mussolini's reign and his war were not of the Italian people, and other people know it. In Germany, however, a basically different situation exists, and Croce clarifies it very considerably.

[1] Reprinted by permission from Chicago Sun *Book Week*, August 6, 1944.

In many respects Benedetto Croce may well be regarded as the greatest living Italian. So great is his prestige that for twenty years he lived under Mussolini, writing and publishing in disregard and even in open defiance of Mussolini, and Il Duce, whether out of temerity or ignorance, did nothing important to stop him. Vincent Sheean in his introduction to *Germany and Europe* makes this remarkable statement: 'The chief reason why Croce was not suppressed, killed or imprisoned probably is to be found in the fact that the Fascists, illiterate or ill-educated people for the most part, could not understand him. Some no doubt did. Mussolini, in the days when he could still read, probably read some of Croce's work and decided it was too "academic" to matter. Undoubtedly he also had a sense of the prestige of Croce even though he did not understand it.'

Croce was born in the Italian province of Aquila in 1866. His name is associated most closely with Naples; he has written profusely and definitively of Neapolitan art, culture and political life. Influenced particularly by Hegel and Marx (neither of whom he fully endorsed by any means), by Goethe and de Sanctis and Vico, and stimulated by the invigorating historical developments precipitated by Garibaldi, Croce early achieved important recognition as a philosopher and historian. His *Philosophy of the Spirit,* completed in 1910, presents philosophy as grounded in—and as an interpretation of—the determining trends and forces of history. This fourfold work, dealing systematically with aesthetic, logical, economic and ethical theory, established Croce as one of the great intellectual leaders of modern times. His influence in the realms of history and literary criticism has been particularly extensive.

Because of his deep interest in history in the making, Croce necessarily became involved in the political life of Italy. In 1910 he was made a Senator of the Kingdom, and after the fall of Mussolini he became Minister of State without portfolio in the Badoglio government. Politically he is quite closely associated with Count Carlo Sforza, who became Minister of State in April of this year.

In *Germany and Europe* Croce presents four essays, one written in 1936, the others late in 1943. Translations are by Vincent Sheean, whose introduction provides background material essential to an effective appreciation of the essays.

Croce makes two main points, one by way of interpretation, the other by way of advice to those who will make the peace. The first point is that there is 'a deep and intimate difference between Nazism and Fascism.' Nazism represents 'a terrible crisis which had been brooding in the history of Germany through centuries,' while Fascism, with its 'invincibly clownlike aspect,' was foreign to the history of Italy and basically repugnant to its people. Heller's account, in *Twilight of the Gladiators,* of the flip-of-the-wrist manner with which the Italian people brushed aside Mussolini and his hollow symbols, when the chance came, bears out Croce's thesis. In Germany on the other hand, Hitler is something more than a balcony barker.

Even so, according to Croce, Nazism does not represent the more significant potentialities of the German people. It is neither recent nor superficial, that is true, but it is only partial: it is like a psychoneurotic blindness, with a history that goes back to the patient's childhood, but which exists in a patient who is for the better part sound and vigorous.

In explaining Nazism, Croce emphasizes 'three almost organic deficiencies' of

Germany, aptly formulated recently in a letter to Croce by a German whose identity he conceals. The first is a tendency for German metaphysical thought to lead to 'criminal fanaticism.' The second is due to the fact that the German people have been spared the experience of serfdom under the tyranny of a foreigner—'an experience from which are born the idea of liberty and the sense of a need for it.'

'The third deficiency, the most desperate of all, was the result of the battle between Arminius and Varus in 9 B.C.: of that battle which decided the Romans to renounce forever the Romanization of Germany'—so that through the centuries it remained, essentially, outside the Latinizing influence which pervaded all the other European nations. In short, the Germans have not belonged. Hence, 'the eternal complaints of the Germans that they are not understood or that they are maliciously interpreted.'

This 'spiritual dissension between Germany and Europe' weighs heavily in Croce's analysis and determines the other main point which he attempts to make. This other point is that, so far as the peacemaking is concerned, 'the evil to be cured has an historical nature,' and that by all means available the dissension between Germany and Europe must be composed. It will not be composed by vengeful punishments, by 'chopping Germany into little states,' by unreasonable restrictions and humiliations. Such tactics will only intensify the national paranoia, as such tactics, after Versailles, did intensify it to the incredible degree of Hitlerian psychopathy.

A wiser policy, however stern and decisive, should allow this war to 'produce in the German people the necessary catharsis and induce it to take its place in humanity . . . as one of the peoples among peoples, one of the strongest among them in the struggle which is intrinsic to the life of humanity and civilization.' In a word, the task set by Croce for the peacemakers is that of revitalizing the Germany of great art, literature and science, the Germany that belongs in the tradition of those civilizing forces that transcend national differences. The patient is not to be flogged for having symptoms, but is to be healed of his disease.

Having offered this advice, Croce does not prescribe the manner of its execution. For this neglect, Vincent Sheean excuses him on the ground that 'he is not a practical politician and cannot, at the age of 78, suddenly become one.' There is hardly any long answer to that. The fact remains, however, that by answering as he does the question of what should be done to the patient that is Germany, he hardly makes it any easier to answer the further question of *how* the patient is to be made well again.

All of which goes to explain why Croce's book is the more significant, while Heller's is the more readable. Heller doesn't ask many questions and the ones he does ask he answers. His answers aren't very profound—but his questions aren't either. Croce is something else again, very much else. Taken seriously, as he must be, he would have the effect of making us stop talking nonsense.

That is as good as saying that he would leave not a few of us speechless. In all seriousness, that is probably a necessary step toward the solution of the German problem and of postwar problems generally. These two books, each in its own way, can help us to avoid Mussolini's own brand of self-deluding, that of talking ourselves out of touch with the realities that stare us in the face.

WENDELL JOHNSON.
State University of Iowa.

Atomic Wonderland

MR. TOMPKINS EXPLORES THE ATOM, by George Gamow. New York: Macmillan. $2.50.

WHEN Charles Lutwidge Dodgson, familiarly known as Lewis Carroll, wrote *Alice in Wonderland,* he supplied a ready-made title for innumerable subsequent efforts by less gifted writers. Most of these achieved an early and well-earned oblivion, and all of them were attempts to transfer the technique of Lewis Carroll's masterpieces to other situations without the literary genius or trained intelligence of Charles Dodgson to make their efforts live. Not so, however, in the case of Dr. George Gamow, Professor of Theoretical Physics at George Washington University, who chose for the title of his first little book *Mr. Tompkins in Wonderland* and further evidenced his understanding appreciation of the master by dedicating it to Lewis Carroll AND TO NIELS BOHR, who has not to my knowledge expressed his feelings at thus being associated in print with Lewis Carroll.

Mr. Tompkins in Wonderland was a most entertaining and inspired effort (also wholly original) to present through the fantastic dreams of the little bank clerk, Mr. Tompkins, a popularly understandable version of certain complex and relatively little understood principles of modern physics. One feature of this book new to such books was the inclusion of three serious, though popular, lectures on the topics which were the subject matter of Mr. Tompkins' fascinating night-mares. So successful was this book and so entertaining that the recent appearance of a second volume of the same type by Dr. Gamow is an event to occasion pleasant anticipatory enthusiasm.

If you have read *Mr. Tompkins in Wonderland* (and why haven't you?) you will need no introduction to the Professor nor his daughter, Maud, nor of course, to our hero, the modest bank clerk, and you will open the book with every reason to expect to enjoy it tremendously. My first reaction was some disappointment over the illustrations (one of the excellent features of the earlier book was the delightful illustrative sketches by John Hookham) which 'because there's a war on' could not be by the same hand as the others and so perforce were done by the author himself. With all deference to Dr. Gamow's very considerable talents, the results made me feel a little sad.

However, after the first feeling of letdown over the illustrations faded, I found this second volume exceedingly good. The mere titles of the dreams, 'Maxwell's Demon,' 'The Gay Tribe of Electrons,' and 'The Woodcarver,' are enough to whet the appetite of most physicists with young and active imaginations, or for that matter, any intellectually cosmopolitan layman. In particular this dream in which the woodcarver who specializes in nuclear synthesis appears struck me as being one of the very best in pure—I was going to say scientific—whimsy.

All three dreams, though whimsical of course, are built upon an underlying stratum of truth in the best present opinion about the structure of atoms and their thermal behavior. Naturally in attempting to picture how an atom would look if magnified to the size of the earth, one must expect a certain amount of distortion—if one may without presumption call it that. This amount of nonscience—to coin a parallel to nonsense—Dr. Gamow has offset by continuing his practice, begun in his first book, of including (this time four) serious but reasonably

readable lectures on the general subject matter of atomic structure.

Since we cannot hope to be specialists in all fields, every one of us must for the most part rely upon specialist-interpreters. Unfortunately there are far too few who possess, as does Dr. Gamow, the *sine qua non:* competence, together with the rarer gifts of literary charm and humor.

M. Alden Countryman
Illinois Institute of Technology

'Reading for Honors'

Breaking the Academic Lock Step, by Frank Aydelotte. Harper, 1944. $2.50.

Frank Aydelotte begins his new book with a plea for a return to 'liberal' education after the war, arguing that 'the greatest defect of that (liberal) education is the regimentation of individuals of different levels of ability into the same program.' This regimentation, wherein all students, whatever their ability, take the same courses, prepare the same assignments, and pass the same examinations, he calls 'the academic lock step.' This lock step holds back the best students, wastes their time, and blunts their interest by subjecting them to a slow moving routine they do not need.

His survey of honors programs in American colleges shows that, of the two hundred or more institutions approved by the Association of American Universities, seventy-five per cent have already begun to establish honors programs that make provisions for their abler students. These programs he classifies under three general headings: first, programs in which honors work is an extra activity over and above the ordinary requirements for graduation; second, those in which honors work is allowed to replace a certain number of courses; and third, those in which honors work replaces entirely the regular curriculum during the two upper years.

Despite the weaknesses inherent in any attempt to cover so much material in so little space, this report is a valuable source book for any one interested in the subject. Teachers engaged in guidance of pre-college students, for example, will find in it information not readily available elsewhere.

However, the reader feels justified in asking for more than a mere source book from a man who, as President of Swarthmore college during the inception of the Swarthmore plan, has personally contributed much to this movement. What are its broader implications? *Why* has it become so widespread during the last twenty years?

Instead of answering these questions, Mr. Aydelotte has been content to show that the model for our honors programs has been found in the great English universities and he suggests that we owe our progress to returning Rhodes scholars who 'naturally seek to apply at home the best of what they learned in England.'

Perhaps because of the limitations of space, or perhaps because of his long preoccupation with the business of Rhodes scholarships, Mr. Aydelotte does not mention that the very *raison d'être* of the honors programs, namely, the emphasis on providing for individual differences, has keynoted the major advances made in the United States since the first decades of the century.

Scientific guidance in choosing a vocation in accordance with the capabilities of the individual was started by Dr. Frank Parsons in Boston in 1908. Early beginnings in child guidance were made before 1910 with the founding of what is today the Illinois Institute of Juvenile Research. Deans of men and women appeared in American colleges by 1910. The testing

and measuring of individual differences, begun by Binet in France in 1905, was carried on by Terman and others in this country before World War I.

Out of these small beginnings grew a mighty movement that has dominated educational reforms. It is the seething and boiling of this movement, permeating even to the top of our educational structure, that is bringing about the reforms that Mr. Aydelotte describes.

No force becomes as powerful as this unless underlying it is some fundamental methodology that gets results. The study of individual differences has been a particularly clear-cut example of the application of scientific methods to human affairs. Readers of *ETC.* especially should take note of the results obtained by this merging of scientific methods and human values even when as haphazard and as unsystematized as it has been, since this aids in understanding the results obtained by the use of general semantics in which this scientific-human orientation is clearly and systematically formulated. Also, the implications of these recent educational reforms cannot be adequately predicted without an understanding of their relationship to the gradual widespread growth of this new orientation. Furthermore, the probable fate of the few highly publicized educational innovations which run counter to this trend can more adequately be foreseen when examined from this perspective.

Mr. Aydelotte's failure to attempt to take a broader perspective is a source of disappointment. In evaluating the reforms as isolated phenomena, he can do no more than hint that they are in some way vaguely desirable. He cannot point the way in which future progress lies. That Mr. Aydelotte is an outstanding administrator has been amply demonstrated by his record at Swarthmore and at Princeton; in this book, however, he fails to make any contribution that would tempt the reader to consider him an outstanding educator as well.

DAVID DONALD MALCOLM
Chicago, Illinois

This power to ABSTRACT is
One of the outstanding characteristics
Of human beings as
Compared with other animals.
And this power is used not only
By mathematicians,
But also by
Artists, musicians, poets,
And all other 'human' beings.
Perhaps some day
We shall measure
A person's 'human-ness' by
His power to abstract
Rather than by the I.Q.
For a person who can
Be loyal to such
Abstract concepts as
Truth, justice, freedom, reason
Rather than to
An individual or a place,
Has the loyalty of a human being
Rather than that of a dog.
Please do not think that
We are using the word 'dog'
In a disparaging sense,
For they are very dear animals;
(Remember that you must not be
A Conclusion-Jumper!)
But still they are animals and
Not human beings.

H. G. and L. R. LIEBER, *The Education of T. C. Mits*

✡ NEWS AND MISCELLANY ✡

General Semantics in Business

The conscious and systematic application of general semantics to business problems is discussed in *The Mines Magazine* (March, 1944) by John H. Jacobs, president of the O. P. Baur Confectionary Company, of Denver, Colorado. The following paragraphs are excerpts from his article:

'When we started checking the real-life-facts in our business . . . . we learned that we were definitely in a rut and had not been able to see our weaknesses because we had become accustomed to them. To us our weaknesses seemed very natural. From our analysis we could safely make the prediction that unless we could adjust our business to the changing times it would be very difficult for us to survive in the complex technological economic world of today and of tomorrow.

'Here we learned a lesson from the science of semantics. In the past, once our plans were laid we made every effort to prove that *our* thinking was right, and we often attempted to make the facts adjust to our planning and thinking. As a result we found ourselves in constant conflict. Today we take a different approach. We make our plans and then continually check them against life-facts. If they do not agree with the facts we adjust our plans accordingly. We have learned the lesson that you cannot adjust outside facts to your own personal *thinking*. You have to adjust your thinking to the facts as they are today and as they constantly change. . . .

'Our accounting system had to be revised. The system we had in use was a good system and not out of date. Unfortunately the system was not structurally similar to the territory it was to represent. It was somewhat like a map of the State of Colorado that shows the city of Denver over in the southwest corner and Pike's Peak out near the Kansas line. Anyone attempting to use such a map would become confused because his map would not represent the real territory.

'Our accounting system did not accurately represent the real facts of our business. The only connection, after all, between an accounting system and the factual operation of a business lies in a similarity in the structure of both. No matter what figures you have on your books they are only symbols similar in structure to certain life-facts. The symbols or figures are not the facts but are often confused with the facts. If you can keep your accounting system similar in structure to the structure of the real-life facts of the operation of your business you will find that you will be able to predict outcomes in your business as accurately as a scientist is able to predict outcomes from his mathematical formulas.

'After we established our accounting system it was necessary to teach management the importance of keeping it accurate. The accounting in the past had been considered mostly in the light of excess baggage and somewhat of a nuisance, especially to our selling and manufacturing departments. Management had to be shown that it could not survive in this complex world unless it could predict

the immediate future; and the only way it could predict with any degree of accuracy was to base predictions on accurate reports.

'We have four different factories — bakery, candy, ice cream and restaurant. Our analysis showed that each of them need reorganizing and adjustment, since few changes in methods had been made over the past fifteen or twenty years, however, the outside world had changed tremendously in this time. Labor costs, for example, had changed, standards of living had changed, selling methods had changed, packaging methods and advertising methods had also changed, yet we were still figuring and thinking in terms of ten or twenty years ago. We were using formulas that were used ten and twenty years ago.

'The problem then arose as to which department should be reorganized first. Here was a semantic problem—which was more important and which was less important. We decided to start on our candy factory. You will be interested to know that our candy factory was the best operating factory we had and, I am sure, had all the other departments operated as efficiently as the candy factory, it would have been difficult to sell management on the need of any changes.

'We adapted our accounting control to our candy operation. Here we realized that no two operations are alike. You cannot take an accounting system like a yardstick and apply it to every business. The system must be adjusted to meet the operation to which it is to be applied. You must adjust your accounting system to the facts and not attempt to adjust *facts* to your accounting system. . . .

'Now that we had the facts of what it was actually costing us to produce our candy we were able to make changes in production methods and see just how these changes affected our efficiency. We were no longer guessing. We made a great many changes. We learned another lesson—that each change, no matter how small, changed the entire picture. We also learned that we had to constantly adjust our thinking and planning as more facts were uncovered.

'The results we obtained were almost miraculous. For the first four months, in the department we previously considered the most efficient, here is what happened. We produced more candy than ever had been produced in the history of our business in the same period. We turned out this production with fifty percent less working hours. We packed more candy by twenty percent in poundage than had ever been packed in a similar period. We packed this amount of candy with about one-half the number of people formerly needed. I need not tell you what happened to our profits in the intervening time. All this happened in a department that we had thought was running very successfully. . . .

'We have learned that we have only begun the job and that the job is an endless one, therefore, we do not expect results overnight. One we make changes we do not feel that the job is done. We know that we have to constantly check our facts and keep changing our methods to agree with changing conditions. We have learned not to worry too much about the future, about the post-war period for example. We know definitely that to get through the post-war period requires adjusting to the times. Many business men are concerned about how they are going to operate in the world of tomorrow, how they will operate under such things as Government control. Let me predict one thing here today. That is, regardless of what kind of control or what kind of Government we have in the future, people

will continue to live in cities similar to Denver. There will be automobile dealers, insurance companies, candy stores, department stores, and other businesses similar to what we have today. The businesses of today that will continue in the future will be those able to adjust to the conditions of tomorrow. If you think for a moment that you are going to run your business as you did in 1928 or as you are still running it today and feel that you can, in some way, adjust the future life facts to fit your way of thinking I can predict that you will not survive very long in the future world. You will only survive if you are able to adjust and change to the changing conditions.'

'Short Course in G. S.'

Francis P. Chisholm, Ph.D., spent the months of July and August at the Institute. He assisted in running the Workshop portion of the July seminar course and later conducted an evening course of six lectures, 'Introduction to General Semantics,' which was attended by some forty people from the Chicago area. It is planned to make these lectures available in mimeographed form, probably at the price of $2.

Dr. Chisholm is also at work on preparing a 'standard short course' in general semantics to meet the rising demand. The first draft of the course will be ready this autumn and after a revision by the committee working with Dr. Chisholm, will probably be available during the early part of 1944.

Dr. Chisholm was formerly instructor in English at Syracuse University, where he received his Ph.D. degree in 1943, the title of his thesis being 'Grammatical Structure and Linguistic Behavior.' The thesis represents an application of general semantics to the field of language and literature.

During the past year and a half, he was co-ordinator of the Syracuse ASTP Program, Auburn Unit. He has recently accepted an appointment at Stephens College, Columbia, Missouri. Those who are interested in cooperating with him on the preparation of the experimental standard course should communicate with him there.

Communications Workshop

From July 24 to August 25 a workshop in communication for students in English, speech, and education was held at the University of Denver. In charge of the course were Professors Elwood Murray and Levette J. Davidson, of the University of Denver, and S. I. Hayakawa, of the Illinois Institute of Technology. During the third week of the course, August 7 to 11, Alfred Korzybski and M. Kendig, of the Institute of General Semantics, conducted lectures and discussions. Thirty-five students were regularly enrolled and many others visited the course. Papers and excerpts from papers presented in this workshop course will be published in forthcoming issues of *ETC.*

Because of the keen interest of many faculty members and students of the University of Denver and of many Denver citizens in the problems of racial minorities, a course of ten lecture-conferences to train leaders capable of dealing more adequately with race relations is to be offered at the downtown college of the University of Denver. Clergymen, business men, union officials, social workers, leaders of minority groups, students, and other interested citizens have been invited to attend the course. Visiting lecturers will speak on the problems of specific minorities as well as on relevant areas of social psychology, anthropology, and economics. Dr. Elwood Murray, who, with

Harold Saks of the Anti-Defamation League and Dr. Prudence Bostwick, have jointly designed the curriculum, will illustrate the application of non-aristotelian formulations to the problems discussed.

Future Seminars

The Institute plans to offer the usual Intensive Seminar during the holidays, December 27th through January 3rd.

The course will consist of 36 hours of lectures by Korzybski. Review and drill will be conducted by M. Kendig and other co-workers who are available at the time.

During the summer of 1945 it is planned to offer another Seminar-Workshop similar to the very successful course which was given for the first time in July, 1944. Probable dates for the 1945 Seminar-Workshop Course will be the three weeks beginning Monday, August 6.

During the fall and winter some short evening courses will probably be offered at the Institute. A schedule of Institute activities will be available some time in October.

Scholarship for Psychiatrist

Mr. David Grossman of Philadelphia (IGS seminar 1941), has given the Institute a scholarship in memory of his brother, Edward Grossman, to provide funds for a psychiatrist to attend an Intensive Seminar. This scholarship provides for the tuition and makes available $100 for travel and living expenses. Applications for the scholarship should be addressed to the Educational Director, 1234 East 56th Street, Chicago 37, Ill.

Second Issue Sold Out

Volume I, Number 2 of *ETC* (Winter, 1943-44) is sold out. The demand for it continues, however, and as more libraries subscribe the demand is likely to grow. The editors are seriously contemplating, therefore, the republication of the second issue. Would readers requiring copies of Vol. I, No. 2, care to place advance orders ($1 for each copy wanted) to make possible its republication? If enough advance payments are received to guarantee half the cost, we shall go ahead with the printing. If there are not enough orders to make republication feasible, the payments which have been made will be returned.

Late!

Although this issue of *ETC.* is dated 'Summer, 1944,' it is being mailed out in early autumn. Many subscribers have written to ask why they hadn't received the summer issue. To them and to all members and subscribers, our apologies.

The editor wishes he could blame the delay on the war, the paper shortage, the manpower crisis, the bottlenecks in transportation, or on anything other than his own personal remissness. Unhappily for his peace of mind, he finds that he cannot. Whether his embarrassment is acute enough to prevent a recurrence of such delays in subsequent issues is difficult to say at present. All he can report is that he is contrite as hell, and resolves to do better in the future. He points with pride, however, to the slight increase in size in the present issue. Support for *ETC.* has been greater than anticipated, so that further increases in the number of pages are being planned.

✯ CORRESPONDENCE ✯

'Rokossovsky kommt!'

SIR: How do you like this illustration of intensional and extensional orientation? The Germans dropped leaflets on the British in which they said, 'The traditional warfare between Germany and England has always been on a gentlemanly, chivalrous basis, until Stalin butted in where he wasn't wanted.' That reminded me of the infinitely boring jokes circulated in Germany in the thirties: 'What *is* an Englishman? An Englishman is a gentleman. And two Englishmen? Two Englishmen are a club. What *is* an Austrian? An Austrian *is* a beggar. And two Austrians? There are no two Austrians. The other one is either a Czech or a Jew. . . .' etc., etc., as long as there were listeners. The conviction that the Englishmen *is* a gentleman gave the Germans a bonehead confidence in those idiotic leaflets. For comparison consider the leaflets dropped on the Germans by the Russians. No premises about what a German *is*. Only what *he is doing at the moment*. Those leaflets contained only two words: 'Rokossovsky kommt!'

ANATOL RAPOPORT

Captain, U. S. Air Corps
Greensboro, N. C.

General Semantics in Egypt

SIR: On several occasions I have written to Miss Kendig, mentioning the fact that during the past year I taught a course in general semantics at the American University at Cairo, Egypt. In reply she said she thought you would be interested in having some account of it. So I am sending this along for you to use or not, as you wish.

First of all I ought to explain my designation as 'war correspondent.' I have finished my work at the University, completing six years of teaching English in Egypt. I came out to Egypt at the age of twenty-two in the summer of 1938, just after graduation from the University of Illinois. I taught English for three years at Assiut College, Assiut, Egypt (American Mission Secondary School), and then for three years at the American University of Cairo. I am now standing by for assignment with the National Broadcasting Company; that is, I am not doing any actual broadcasts yet, but I shall probably be on the air as soon as there is more important news in this part of the world. During the past year I made a few broadcasts, substituting for the regular N.B.C. man in Cairo.

The American University at Cairo is a fairly small institution, under the direction of an independent board in Philadelphia. It has about 400 students, equally divided between a secondary department and the college. There is also a small Department of Education, School of Oriental Studies, and Extension Division. I was assigned to teach English in the second year secondary, and freshman, sophomore, and junior levels in the college. Freshman and sophomore courses were much the same as those in freshman English in an average American college, but with special emphasis on the idiomatic difficulties of Arabic and French-speaking students.

One of the courses that I was assigned to teach was junior English 304 (three hours a week). Year before last it was purely a composition course, but the catalog listed 'History of Language and Semantics'; the head of the English department had instituted the title in the hope that some day a teacher might be found to teach such a course. I had been interested in semantics for some time, following the books of Richards and Ogden, knowing little about the work of Korzybski; it was not until the spring of last year that I got a copy of *Science and Sanity* for myself. Then in the summer I rashly offered to take over the course and teach general semantics, omitting the history of language angle. . . .

I spent the first few months acquainting the students with the general problem of language structure—its importance in everyday life and in the formation of our institutions. *Language in Action* was very helpful here. I explained abstracting, the levels of abstraction, and tried to introduce some consciousness of abstracting. I realize now that I did this in a very fumbling manner, but the class was forebearing, and later I discovered that the time had not been lost. As a background I found my own experience under two hundred hours of psychoanalysis very helpful.

When, during the first week of December, 1943, copies of *Science and Sanity* sufficient for the whole class arrived, my first aim was to present the non-aristotelian system as quickly as possible. So we spent about two weeks on chapters II and IV, and then moved back to Book II. We covered chapters XXIV to XXIX (except XXVII, on higher order abstractions) very carefully, concentrating particularly on the chapter on non-aristotelian training. The technique was for students to read assigned pages at home (5 to 10 a lesson) and then participate in class discussions, supplemented by explanations from the teacher. I used the 'structural differential' constantly.

From the very beginning the interest and enthusiasm of the class were amazing. By the end of the third quarter the class seemed to have got a fairly thorough mastery of the non-aristotelian system, and there was plenty of evidence of a growing 'consciousness of abstracting.' This showed itself in a greatly heightened critical attitude towards all verbal material, especially 'assembly' talks.

I also noted the beginnings of what might be called a miracle in this part of the world, namely, a general lessening of excitability in conversation. Arabic-speaking students (they constituted about half the class; others had Greek or French backgrounds) found the course most difficult, but they also stood to gain most, for they were reared in a tradition where the word *is* the thing, and the language is considered to be divinely given. (The Arabic of the *Koran,* model for all written Arabic, is supposedly modelled after a heavenly counterpart. Audiences are greatly moved by the sound of the phrase and often become wildly excited over a speech in high-flown classical Arabic, which they understand scarcely at all. A verbal insult is considered a *greater* offence than physical violence.) At the end of the year more than half a dozen of the more enthusiastic students said, 'You have changed our lives!'

Two weeks before the end of the year I distributed a list of review questions, which to some extent summed up the material covered during the year. The final examination consisted of five questions selected from the list. I realize that in a written examination I could get only intellectual (verbal) account of what had been learned. Still, the class was small, and I had personal interviews with every student; thus I was able to watch the stu-

dents and observe how much the 'lower centers' had been affected. Giving a very rough impression, I should say that out of eighteen students in the class eight acquired 'consciousness of abstracting' to a very large degree, seven benefited considerably, while three were only slightly if at all changed. It was interesting to note that those who most thoroughly appreciated the system and appeared to acquire consciousness of abstracting to the greatest extent were those who were already best oriented psychologically. Those of fixed, dogmatic belief, the eternal arguers on purely verbal grounds, were much slower in catching on.

On the whole, I am sure that I benefited personally much more than did any of my students. Korzybski was certainly right when he said that the best way to learn the system was to try to explain it to someone else. I also tried to apply the system, as far as I could under the limitations of the curriculum, in my teaching of English in other classes. Here, however, I was faced by a strong feeling of frustration: so very much to be done, textbooks to be rewritten, the whole teaching method to be revised. Teaching grammar out of the traditional text I felt like a hypocrite and often tossed the book away in disgust and launched out on a path of my own. I look forward to the time when I can come to Chicago, get a more thorough non-aristotelian training myself, and then apply it in the field of education. My job as a war correspondent is only an interim occupation for the duration of the war.

G. E. JANSSEN

U. S. War Correspondent
A.P.O. 787
c/o Postmaster, New York City

Non-Identity

SIR: . . . I work as an inspector in the Willow Run bomber plant. Every minute of the work is practice in the fundamentals of general semantics as I understand them. How true it is to the non-verbal facts is the idea that no object is 'identical' with any other: witness the necessity for visual inspection of thousands of metal parts of the 'same' pattern. Not even on the basis of our gross, macroscopic, visual inspection is it possible to say correctly that two parts are 'exactly alike.'

Then the dependence of this bomber plant on human language building is amazing. Not even the most unskilled jobs can be accomplished without it. I wish I could go into detail on how often the hard feelings, mistakes, poor work, etc., in this factory is a result of poor, inadequate language habits.

LOUISE E. SWEET

Ann Arbor, Michigan

The firm determination to submit to experiment is not enough; there are still dangerous hypotheses; first, and above all, those which are tacit and unconscious. Since we make them without knowing it, we are powerless to abandon them.

H. POINCARÉ, *The Foundations of Science*

Reprints Obtainable

The following reprints may be obtained by writing to the editorial offices of *ETC.* All prices postpaid.

JEROME ALEXANDER: "Successive Levels of Material Structure," from *ETC.*, Spring, 1944; 35c (ten or more, 20c).

OLIVER BLOODSTEIN: "General Semantics and Modern Art," from *ETC.*, August, 1943; 25c (ten or more, 15c).

S. I. HAYAKAWA: "A Linguistic Approach to Poetry," from *Poetry: A Magazine of Verse*, May, 1943; 25c (ten or more, 15c).

——— "Science and Sanity (review)," from *American Speech*, October, 1943; 15c (ten or more, 10c). (This article appeared in *ETC.*, Spring, 1944, under the title "Linguistics and the Future.")

——— "Race and Words," from *Common Sense*, July, 1943; 15c (ten or more, 10c).

WENDELL JOHNSON: "People in Quandaries: And Why They Are There," from *ETC.*, Winter, 1943-4; 25c (ten or more, 15c).

ANATOL RAPOPORT: "Newtonian Physics and Aviation Cadets," from *ETC.*, Spring, 1944; 25c (ten or more, 15c).

EDWARD THORNDIKE: "Science and Values," from *ETC.*, August, 1943; 25c (ten or more, 15c).

Order from

ETC.: A REVIEW OF GENERAL SEMANTICS

Illinois Institute of Technology

3300 Federal St., Chicago 16, Illinois